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Title of Thesis: "The Impact of Overeating on Mood Among Unrestrained College Females"

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ABSTRACT

Title of Thesis:	The Impact of Overeating on Mood Among Unrestrained College Females
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Negative moods are common antecedents to binging; however, mechanisms and emotional consequences remain unknown. In the present study, college women were randomized to one of nine cells in a 3 (Mood Induction: positive, negative, no mood) X 3 (Activity: overeating, distraction task, alone wait) design. Mood was measured using the Vigor and Depression subscales of the Profile of Mood States (POMS). Self-focused attention was measured as the mechanism for affect change. Participants in the Positive and Neutral mood groups who ate the meal decreased in positive affect over time. Those in the Negative mood group did not. Self focus did not change over time. No changes in negative mood were noted. It is unclear whether the act of overeating changes affect differently from time passing. However, our sample was self-focused at baseline and further research on attentional focus is needed.

THE IMPACT OF OVEREATING ON MOOD AMONG UNRESTRAINED COLLEGE FEMALES

by

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INTRODUCTION

Hunger is considered a fundamental reason to eat. However, research has shown that sensations of hunger are not required for, and do not correlate well with the act of eating (Rogers et al., 1988; Rolls et al., 1988; Wardle, 1990). Moreover, hunger has been described as a label that is not universally applied to an identical set of physiological symptoms (Schachter, Goldman & Gordon, 1968). Rather, hunger is only one of many factors that cause the initiation of eating behavior, which could also include learned associations between environmental cues and eating (Wardle, 1990; Weingarten, 1984; Weingarten & Gowans, 1991), desires or urges to eat a particular food (Weingarten, 1984), and/or emotions.

During the late 1960s and into the 1970s, several theories were proposed to explain the potential mechanisms that might link emotions and eating. In particular, these theories have focused on the use of food to regulate mood. These theories include Schachter's two-factor theory of emotions (Schachter, 1964), externality theory (Schachter, 1971), psychosomatic theory (Kaplan & Kaplan, 1957; Schachter, Goldman and Gordon, 1968), restraint theory (Herman and Mack 1975), and social learning theory (Bandura, 1977; 1997; 1999).

Schachter's (1964) two-factor theory of emotions postulated that emotions result from the cognitive labeling of physiological arousal states. According to this theory, human emotions contain two parts: physical arousal and a cognitive label. Both of these elements must be present to experience an emotion. Arousal occurs (e.g., increased heart rate, etc.), people label the arousal, and then the emotion is experienced. This theory was later extended into the externality theory (Schachter, 1971), which describes the initiation

and termination of eating as dependent on external information, such as the time of day or the smell or sight of food, rather than on physiological cues such as hunger.

Kaplan and Kaplan (1957) also postulated that individuals who lack awareness of internal states may overeat when they feel anxious. Their psychosomatic theory suggests that this relationship is strongest among obese individuals and may explain, in part, why obese individuals have difficulty regulating energy balance. In particular, they suggest that high levels of anxiety and eating behaviors are incompatible conditions, and that individuals learn that anxiety is relieved by eating – a form of learning through negative reinforcement. Schachter and colleagues further refined this theory, supporting the idea that feeding is influenced more by cognitive or emotional processes than by physiological need (Schachter, Goldman & Gordon, 1968).

The idea that individuals learn that food can be used to regulate emotional states is an essential component of Herman and Polivy's (1975, 1984) dietary restraint theory. Restraint theory focused on the dietary restrictions that individuals impose upon themselves. It is proposed that dietary restriction makes individuals vulnerable to disinhibited eating in response to emotional arousal or distress or in response to a small portion of palatable but forbidden food.

The regulation of eating behavior also can be examined from a social learning theory (SLT) perspective (Bandura, 1977; 1997; 1999). This theory emphasizes a bidirectional interaction between person and environment that results in the individual learning to regulate behavior to obtain rewarding or reinforcing consequences. In this model, the relevant factors regarding the person include affect, cognitions, past experiences, and behaviors; the environment includes the presence and actions of others

that result in reinforcement (Bandura, 1999). With regard to understanding feeding as a mood-regulating behavior, this theory emphasizes that behavioral outcomes, such as anxiety- or depression-reduction, and the value the individual places on the outcome are critical determinants of long-term behavioral patterns. The individual, according to this theory, is an active regulator of his or her behaviors to achieve positive emotional states.

Self- and mood-regulation. Self-regulation is any effort by an organism to alter its own responses (Tice & Bratslavsky, 2000). Typically, this regulation involves overriding a normal or natural tendency (as a result of habit, learning, inclination, etc.) and substituting another response (or lack of response) in its place (Tice & Bratslavsky, 2000). Mood regulation is a subset of self-regulation and can be described as the process of attempting to change or replace a current emotion with another, with the ultimate goal of feeling good (Larsen, 2000). Mood regulation can be conceptualized as a thermostat (Larsen, 2000) with an emotional set point established by the individual. Deviations from this set point activate a regulating mechanism (e.g., either cognitive strategies or certain behaviors) to eliminate the discrepancy. With regard to feeding, it is hypothesized that some individuals use food to regulate mood. Once food becomes associated with improved mood, antecedents to negative moods (e.g., work deadline) elicit eating. This pattern, in which eating is reliably associated with improved mood, becomes cyclic.

Food as a mood-regulating substance. Interest in the connection between mood and eating behavior has a long history. As early as 1922, it was reported that certain foods had a negative effect on children's behaviors and mood (Shannon, 1922). Currently, interest in the food-mood relationship focuses on how eating to regulate mood

influences body weight regulation, including the development and maintenance of overweight and obesity (Ganley, 1989; Greeno & Wing, 1994; Haddock & Dill, 2000; Geliebter &Aversa, 2003). It is well documented that people's food choices, quantity, and frequency of meals are affected by their moods (Canetti, Bachar, & Berry, 2002). Much current research has focused on examining the antecedent mood state as it impacts the dependent variable of eating behavior (Larsen & Prizmic, 2004).

There have been two main research paradigms used to examine the effects of mood on feeding or emotional eating. Naturalistic studies have examined emotional eating among participants in weight reduction programs or among those with eating disorders, such as bulimia nervosa. These types of studies have been suggested to be a straightforward way of gaining ecologically valid data (Alpers & Tuschen-Caffier, 2001). By eliminating the laboratory atmosphere, it is possible that participants provide more accurate information and experience more realistic emotions. Other studies have used experimental designs, relying on mood induction techniques, to determine whether those who experience mood changes will increase or decrease the amount of food eaten. Within this body of literature, the influence of emotions on eating behavior has commonly been studied under the heading of "stress-induced eating," and stress has been broadly conceptualized to include a variety of negative and positive affective states. However, there has been a greater emphasis on the impact of negative affect on eating. These two paradigms, naturalistic and experimental, are reviewed in the subsequent sections.

Naturalistic paradigms

Negative mood in naturalistic paradigms. In the stress-induced eating literature, negative moods, such as anxiety and fear, are the most commonly studied. These studies generally support the notion that negative mood precipitates pathologic eating episodes. For example, Abraham and Beaumont (1982) reported that bulimics reported negative mood states (e.g., tension, loneliness) precipitating binges, thus leading them to conclude that binges are usually preceded by dysphoric mood states. They note that a binge, at least temporarily, alleviates the negative mood state. However, the long-term consequences for many patients are to experience negative affect such as depression and self-depreciation.

These results also have been supported by more recent studies. Wegner and colleagues (2002) used ecological momentary assessment with electronic diaries to assess the moods associated with sub-clinical binge eating behavior in college students. Participants reported more negative affect, including anger and guilt/self-blame on days when they reported bingeing compared to non-binge days. Unfortunately, the authors did not measure mood prior to the eating episodes. It is impossible to know, therefore, whether negative mood preceded the binge episode.

Other studies also have suggested that negative mood precipitates a binge (Johnson-Sabine, Wood & Wakeling, 1984; Schlundt, Johnson, & Jarrell, 1985). A unique study examining the self-reported eating habits of overweight, normal-weight, and underweight individuals showed that the overweight individuals reported larger food intake during negative mood states (e.g., sad, bored, angry) and negative situations (e.g., arguments, losing money) compared to either the normal weight or underweight groups

(Geliebter & Aversa, 2003). These authors also found a striking pattern of under-eating by the underweight group during negative emotional states and situations. These results point to the potential importance of emotional eating and body weight regulation.

Positive mood in naturalistic paradigms. Historically, less research has focused on positive mood-induced eating compared to negative mood states. Although a few studies have reported that overeating is not associated with positive moods (Lowe & Fisher, 1983; Schmitz, 1996), others have suggested that the amount of food eaten increases in positive mood states (Macht, 1999). When combined with the evidence that negative mood is a common antecedent to a binge, it appears that increased food intake may occur in both mood states. This increase in eating behavior in response to either mood state is supported by the continual self-regulation concepts proposed by Thayer (1989) and others (Grunberg, 1982). Continual self-regulation suggests that mood may be regulated using a variety of substances (e.g., nicotine) and behaviors (e.g., watching television), and that these methods may be interchangeable, as long as the satisfying mood state occurs (Grunberg, 1982; Thayer, 1989).

Schlundt and colleagues (1988) reported that positive mood is related to overeating in social situations. This finding is consistent with the social facilitation of eating research indicating that meals eaten in a social context are larger compared to those eaten alone. In a more recent study, Patel and Schlundt (2001) also found that positive moods were related to increased food intake in obese participants enrolled in weight management studies, although they failed to find an interaction between positive mood and social context on increased food intake. Two interesting findings were reported from this study. First, the effect size of positive mood on food intake was

slightly more than twice that for either negative or neutral moods, suggesting that further research on positive mood induction should be considered. Second, there was a difference in the type of food eaten in a social context versus those meals eaten alone, with a larger percentage of calories from fat and protein in meals eaten socially. This finding suggests that types of food as well as emotional states are both important variables to consider in understanding emotion-induced overeating and its consequences. During positive emotional states (e.g., confident, happy, playful) and situations (e.g., falling in love, hearing good news), underweight individuals have been found to eat more than usual (Geliebter & Aversa, 2003). These results suggest support for the idea that food may be used as a mood self-regulator, but that it may be a more salient regulator in certain groups of people.

Taken together, these studies suggest that mood changes may precipitate an overeating episode for clinical populations (i.e., bulimics, the obese). A mood-regulation perspective argues that if a person eats in response to a negative mood, then the act of eating somehow reduces negative mood. Further, eating may serve to prolong or intensify positive mood when eating occurs in response to a positive mood or event. How eating changes mood, however, is unclear. In addition, it remains unknown if all mood states are affected in the same way by eating. It is possible that anger and depression, although both negative mood states, are affected differently by eating. Similarly, two distinct positive emotions (such as excitement and joy) may also be differentially affected. Joy has been associated with an increase in openness to experience (Izard & Ackerman, 2000) and attentional focus (Fredrickson, 1998). Sadness, on the other hand, elicits responses opposite of joy. There is some evidence to

suggest that people eat more during anger and joy than during fear and sadness (Macht, 1999), suggesting that regulation of mood states by eating may depend on specific mood type, or on other individual differences. Finally, there is little research on normal populations of women or on men's eating behaviors, leaving unanswered the question of whether mood regulation with food functions in the same way in normal eaters as in clinical samples.

Experimental Paradigms

Laboratory-based designs measure the amounts of food eaten under different mood conditions and in different types of participants. Mood has been induced in a variety of ways. These methods include: task success and failure conditions to induce positive and negative mood states, respectively (Kenardy, Butler, Carter & Moor, 2003); emotionally arousing video segments, such as comedy acts or domestic violence scenes to induce positive or negative emotional states (Cavallo & Pinto, 2001); and standardized mood induction procedures, such as the Velten mood induction technique (Velten, 1968), which are designed to induce positive and negative moods by using self-referent statements.

Participant characteristics are also important. Degree of dietary restraint has commonly been cited as an important determinant of emotional eating behavior. A restrained eater chronically limits food intake for the purpose of weight control (Herman & Polivy, 1984; Lowe et al., 2001) and level of restraint affects the amount of food eaten in various experimental paradigms. For example, restrained eaters eat more than unrestrained eaters following a preload food such as ice cream or milkshakes (Herman & Mack, 1975).

Dietary restraint appears to influence eating in response to mood. Restrained eaters increase food intake during conditions of negative affect (Rotenberg & Flood, 1998) and positive affect (Cools, Schotte & McNally, 1992). Cools, Schotte, and McNally (1992) exposed women with varying degrees of dietary restraint to a comedy, horror or neutral film segment, and assessed their food intake. Exposure to the horror film increased food intake in highly restrained eaters but not in unrestrained eaters. There were similar effects on food intake for the positive mood induction, or comedy film. Thus, in this study, restrained eaters tended to increase food intake regardless of the valence of the affective state whereas unrestrained eaters were unaffected by the emotion induction. However, most studies examining restraint as it pertains to mood and eating have conceptualized feeding as a consequence of, rather than an antecedent to, a mood state.

Negative Mood in Experimental Paradigms. Recently, Macht and colleagues (2002) examined the impact of different emotions on eating chocolate in healthy men. Using emotional movie segments to induce four basic emotions (e.g., fear, sadness, joy, anger), desire to eat and hunger were rated on visual analogue scales. Men reported less desire to eat in the sadness and the anger conditions as compared to the joy and fear conditions. They also rated chocolate as less pleasant and were less likely to endorse the desire for more chocolate in the sadness condition. The authors suggest that these results can be explained by the effects of mood on motivational and cognitive processes, which have been explained by the congruence hypothesis. According to this hypothesis, positive emotions increase pleasure in eating whereas negative emotions decrease the pleasurable and increase the negative aspects of eating. For example, negative emotions

may accentuate any unpleasant tastes in the foods or increase concerns about gaining weight (Macht, Roth & Ellgring, 2002). These results are of particular importance because they contradict previously reviewed literature showing that people increase their eating in response to negative affective states and that negative affect commonly precedes food consumption, at least in clinical populations (e.g., Rotenberg & Flood, 1998). These contradictory results suggest that there may be alternative explanations and hypotheses linking mood and eating.

However, there are several possible reasons why the Macht et al. (2002) study differs from results of previous work. First, the sample, consisting of healthy men, may not be appropriate to compare with prior work using predominantly female, clinical samples. Second, it is possible that food affects mood in multiple ways. The congruence hypothesis previously proposed may apply only to certain groups of people. It may be that self-regulation theories are more applicable for other groups. And, third, the use of chocolate, a highly palatable food, had differential effects when compared to studies using crackers.

Another study that had somewhat surprising results used a task success/failure design to induce a positive/negative mood state in a non-clinical sample of male and female college students. In this study, participants in the negative mood condition ate fewer crackers than those in the positive mood condition (Kenardy et al., 2003). This reduction in eating in response to the negative mood was surprising from a mood-regulation perspective because of the overwhelming evidence that suggests negative mood is commonly experienced by individuals prior to a binge eating episode. The authors suggest that mood-regulation theories may not apply to non-clinical samples

(Kenardy et al., 2003). Alternatively, it is possible that binging on crackers is out of the realm of realistic experience.

In addition to amount of food eaten, perceptions of the eating event also vary. Comparing clinical and nonclinical samples on amount of food eaten is one way to address this point. Telch and Agras (1995) measured amount eaten following a mood induction in binge eating disordered patients (BED) and weight matched controls. They found group differences in amount eaten and perceptions of eating (Telch & Agras, 1995). Importantly, BED participants ate more at two meals (breakfast and lunch) than the non-eating disorder controls, regardless of mood state. Participants tended to eat the same amount after both the negative and neutral mood induction procedures, regardless of eating disorder diagnosis or control status. BED participants who labeled their eating episode as a "binge" reported a significantly more negative mood state than those who labeled their eating episode as "overeating." Thus, in addition to being an antecedent to eating behavior, mood state may also play an important role in altering perceptions of eating behavior in clinical samples.

In a similar study, negative mood, but not caloric deprivation, significantly increased BED participants' reports of loss of control over eating (Agras & Telch, 1998). For self-defined binges, negative mood, but not caloric deprivation, increased the occurrence of a binge. However, for investigator-defined binges, both deprivation and negative mood increased the occurrence of a binge, suggesting that for individuals with binge eating disorder, negative mood was perceived as a greater cause for binge eating episodes than was caloric restriction. Importantly, participants in the negative mood condition experienced a significant decrease in anxiety after eating.

Positive Mood in Experimental Paradigms. Clinical observations and prior research have focused less on the impact of positive emotion on eating behavior, possibly because positive affect is more difficult to induce experimentally because most individuals report generally positive affect at baseline (Watson & Clark, 1988). For example, Cavallo and Pinto (2001) investigated the effects of smoking status and affect on food intake in highly restrained young (18-25 years old) women. After viewing a domestic violence or comedy film segment to induce a negative or positive mood, respectively, participants were given free access to snack foods. Emotional arousal, regardless of valence, did not result in different food consumption between smokers and nonsmokers. However, self-reported mood changed only in the domestic violence condition with viewers of the domestic violence film reporting higher levels of negative affect immediately after the film and those in the comedy film condition reporting consistent levels of negative affect across all time points. Participants in both film conditions reported similar levels of positive affect at each of the time points, and the authors described difficulty in producing positive mood induction.

Similarly, Cools, Schotte, and McNally (1992) attempted to induce positive, negative, and neutral moods by using a comedy, horror, and informational video segments. For participants in the neutral mood condition, there was an inverse relationship between food intake and level of dietary restraint. That is, food intake decreased with increasing levels of dietary restraint. Additionally, restrained eaters increased the amount of food eaten in both positive and negative mood conditions, although the negative mood condition appeared to be more disinhibiting than the positive

mood condition, which may reflect difficulty in inducing a robust positive mood in a laboratory based paradigm.

Post-Eating Mood

Relatively little research in the area of emotions and eating has been devoted to understanding the emotional consequences of eating (Larsen & Prizmic, 2004). It has been assumed that the act of eating necessarily exerts a desired effect on mood. Larsen and Prizmic (2004) point out that the ingestion of food likely alters affect through influences on blood glucose and hormones. However, Ganley's (1989) review on emotion and eating from 1957 to 1989 found surprisingly few experimental or quasi-experimental studies that examined post-eating affect. Of the few studies that did, the results have been inconsistent. A reduction in anxiety after eating was found in only three studies, all of which used foods considered to be highly palatable (Slochower, 1976; Slochower & Kaplan, 1980; Robinson et al., 1980). Other studies found post-eating states such as increased sluggishness and drowsiness (Swanson & Dinello, 1970), which are not equated with negative affect *per se*, but may represent changes in affect after eating. Importantly, most studies either did not assess post-eating state or found no anxiety reduction (McKenna, 1972; Resnck & Balch, 1977; Ruderman, 1983).

Interestingly, when mood is measured post-eating, results are varied. Guertin and Conger (1999) examined the effects of induced mood and food type on perceptions of eating in a sample of females representing a continuum of bulimic symptomatology. Contrary to affect regulation theories, mood worsened in this sample only when participants evaluated the eating episode as negative. That is, when participants reported feeling out of control and regarded the eating episode as a binge, their mood worsened.

However, when participants reported feeling in control of the eating session, or appraised the eating episode as a snack, rather than as a binge, their mood remained stable compared to baseline.

Another study examining post eating mood state from a mood-regulation perspective (Kenardy, Butler, Carter & Moor, 2003) used male and female participants from a non-clinical population. Participants were given the POMS to assess mood at arrival, post mood manipulation, and post eating. Following a perceptual accuracy task success or failure condition to induce a positive or negative mood state, respectively, participants were given free access to crackers under the initial guise of a taste test. Following the taste test, participants were left alone and told that the crackers would be thrown away after the session and, therefore, they should feel free to help themselves. Quantity of crackers eaten was assessed by weighing the remaining crackers after the participant had left the room.

For all participants, pre-eating and post-eating mood ratings changed, varying by gender and condition. Specifically, the greatest mood change was a reduction in negative mood in female participants in the negative mood condition. Males in the negative mood condition also showed a decrease in negative affect post-eating, although to a smaller extent than their female counterparts. Importantly, however, females in the positive mood condition exhibited a decrease in positive mood after eating. Males in the positive mood condition, on the other hand, exhibited a reduction in the negative component of their mood after eating. These results suggest that eating may have differential mood effects for women and men. In females, the authors suggest that eating may not only reduce negative affect, but may also serve to maintain a neutral mood state.

Tuomisto and colleagues (1998) examined reasons for initiating eating, reasons for cessation of eating, and emotional responses to eating in obese men and women. Seventy-eight female and 36 male obese participants completed self-monitoring diaries during a 24-h period, in which they selected the main reason for starting and stopping an eating episode. Hunger was chosen as a reason to start eating in only 20% of cases. Environmental cues, such as mealtime, were selected as the main reason for the initiation of the majority of eating episodes. Gender differences were found as well. Men had a greater tendency to initiate eating for environmental reasons than women, whereas the opposite was found for the termination of eating, with women more likely to stop eating for environmental reasons than men. Also, changes in affect after eating revealed a significant decline in negative emotions such as tension and tiredness, and in the heavier subjects a trend for increased happiness was observed following eating.

These results support the notion that the relationship between food and mood may vary by gender (Klein, Faraday, Quigley, & Grunberg, 2004). Still, many other questions remain regarding this relationship. Current mood state (Macht & Simons, 2000), as well as how a person perceives the eating episode, as positive or negative (Geurtin & Conger, 1999), and as in control or out of control (Telch & Agras, 1995) are also important factors. Overall, it remains unclear whether emotions induce eating and, if so, what specific effects emotion-induced eating has on mood. Does emotion-induced eating regulate mood? If so, does this mood regulation occur globally or only for subgroups of people? In addition, the mechanism behind mood regulation with food remains unknown. Most studies have been unable to make general statements about the relationship between mood and eating because the relationship is strongly affected by

individual differences. Also, emotional eating in response to negative life events is episodic, meaning that people may use other methods for responding to emotional events in the place of eating (Ganley, 1989). It could be that eating does not exhibit the desired effect on mood all the time or that people do not always use food to regulate mood and instead turn to other sources.

Self focused attention as a mechanism to explain emotional eating

It has been established that there are many antecedents to eating that do not involve hunger, including internal feelings (i.e., positive or negative affect) and actual events (i.e., social gatherings). However, less is known about the causal process involved in eating when hunger is not present. Self-focused attention, defined as "an awareness of self-referent, internally generated information that stands in contrast to an awareness of externally generated information derived through sensory receptors" (Ingram, 1990, p. 156) may be one of the factors involved in this process.

Self-focused attention has most commonly been studied in relation to depressive or dysphoric symptomatology (Mor & Winquist, 2002). In support of the idea that depressive affect increases self-focus, Carr et al. (1991) induced either a happy or sad mood state by using musical selections, and measured self-focused attention as indexed by a shortened version of Exner's (1973) Self-Focus Sentence Completion. They found that happy participants wrote fewer self-focused responses than sad participants. These results support the proposition that increased self-focused attention is related to negative mood and decreased self focused attention with positive mood.

Changes in self focused attention and mood are related. Similarly, changes in mood are related to eating behavior. It is possible, then, that self-focused attention is a

driving force behind mood change after eating. Wicklund (1975) proposed the escape theory to explain changes in mood that may occur after eating via a motivated shift to low levels of self-focus (Wicklund, 1975). This theory suggests that people sometimes find it aversive to be aware of themselves; and, therefore they seek to escape from this awareness (Wicklund, 1975). This theory is based on the idea that self-directed attention initiates a comparison between the "real" self and the "ideal" self; a process that is likely to eventually uncover some perceived personal shortcomings and cause discomfort. This outcome is particularly likely in people with eating disorders, or the obese (Heatherton & Baumeister, 1991). These groups of people are likely to struggle to regulate their food intake or eating behaviors, to achieve an “ideal” regarding their weight and their eating patterns; and, when they do not achieve their ideal, they may experience depressed affect. In order to lessen this discomfort or alleviate depressed affect, people may try to escape their self-focused attention by adjusting or narrowing their focus of attention to the present and immediate stimuli (Heatherton & Baumeister, 1991).

By making this adjustment, it is possible to avoid meaningful comparisons of the self against broad standards or expectations, which is the essence of self-focused attention (Carver & Scheier, 1981). According to Carver and Scheier's model (1981), attention focused on the environment opposes attention to the self; as attention to the environment increases, attention to the self decreases, and vice versa. Scheier (1976) argued that for a person high in self focus, strong affect is experienced as more salient. If this is correct, it is likely that a person experiencing strong negative affect may attempt to shift his/her attention externally, which may reduce the experience of negative affect. This phenomenon, of a removal of self focus, has commonly been described in binge

eaters, for whom eating may serve to remove self-focus (Heatherton & Baumeister, 1991). According to this view, some people use food the way other people use alcohol - as a means of escaping negative self awareness. It is possible that those who desire to lose weight or those who attempt to restrict their food intake for weight loss purposes are subject to negative self evaluation and eating may serve to remove self focus for them.

Distraction and self-focused attention in eating

It has also been suggested that eating changes mood simply by distraction. Distraction has been described as involving a disengagement from or avoidance of a current situation (Larsen & Prizmic, 2004). Most commonly, distraction is discussed in terms of avoiding negative mood states, in which the ultimate goal is getting one's mind off a negative emotion or event (Larsen & Prizmic, 2004).

In relation to eating, if a person perceives an eating episode as a failure because it does not match their ideal, then a person is likely to have a negative self focus. This negative self-focus, or negative affect may be somewhat alleviated by distraction. That is, by diverting attention away from the negative affect and the discrepancy between the real and the ideal self, an individual may improve their affect. However, if a person perceives an eating episode as positive (i.e., views self as being "good" or successful), then removing self-focus, either by distraction or other mechanisms, may lead to dysregulation of eating behavior. This circumstance can be seen in social gatherings, where studies have shown that people eat more than when alone (Schlundt et al., 1988).

Purpose of current study

Little past research directly examines the impact of eating on mood state or the emotional consequences that follow eating (Larsen & Prizmic, 2004). Of these existing

studies, mixed results have left many unanswered questions. There are several possible reasons for these inconsistent results, such as the food choices used in experimental studies (e.g., non-palatable crackers) or the self-report biases that may occur during naturalistic studies.

The purpose of the present study was to examine the impact of overeating on mood in comparison to two non-eating activities, which served as control conditions. A mood induction procedure was utilized to establish two different baseline mood groups; positive and negative. A third group was not given the mood induction and were considered to be neutral in mood. Changes in mood were measured after three activities; overeating, distraction and waiting. Affect change was examined from post-mood induction to post-activity.

Overeating was defined as consumption of a 810 kcal cheese pizza. Importantly, overeating is conceptualized as an independent variable. Mood changes after eating were compared with changes in mood associated with two control activities (a distraction task or wait period). The goal was to determine whether any reported changes in mood after eating resulted from overeating *per se* rather than distraction or the passage of time. Therefore, overeating was compared to the distraction and waiting. This study differs from many past studies on this subject in that we used a highly palatable food choice (cheese pizza) and asked participants to overeat, rather than to snack.

Pizza was chosen for several reasons. First, pizza is consistent with food choices commonly made during bingeing episodes, and is a food that college participants were familiar with and unlikely to object to overeating. In contrast, studies that have used other food choices to induce an overeating episode, such as crackers, have produced

mixed results. It is possible that overeating on crackers alone is out of the range of normal eating experience, because crackers have been described as "a neutral sort of food, neither liked nor disliked by most people," (Schachter, Goldman, & Gordon, 1968). Others have suggested that sweet and salty foods as well as foods high in both fat and calories, are among the food types often preferred by binge eaters (Marcus, Wing, & Hopkins, 1988). Overeating on pizza, however, may be more in line with real life situations of college-aged students. Additionally, it is well known that holding internal state constant, people are more likely to begin and continue eating when food smells, looks, and tastes good (Schachter & Gross, 1968). Because the absolute palatability of a food (either positive or negative) has been regarded to be a property of food only mildly affected by the internal states of the participant (Nisbett, 168; Polivy, Herman & McFarlane, 1994), it was assumed that pizza would be a highly palatable food for all participants.

Design

The present study employed a 3 (Mood Induction: positive, negative, none) by 3 (Activity: overeating, distracting task, waiting) by 2 (Time: post-mood, post-activity) mixed design, with Mood group and Activity as between subject variables and time as the within subject variable. Although measures were taken at baseline, all analyses examining the hypotheses were performed from post-mood to post-activity time period. The baseline mood measurement was only for the purposes of a mood induction manipulation check. Mood was induced at baseline using the Velten (1968) positive mood induction, the Velten (1968) negative mood induction, or no mood induction (control group). Following the mood induction, participants engaged in one of three

possible activities: overeating on an 810 kcal pizza, completing a distracting task (e.g., math problems or letter searches), or waiting alone in a room. Each activity lasted 15 minutes.

Measurements on the dependent variables took place at three time points for those in the positive or negative mood groups: baseline, post-mood induction, post-activity. The neutral or no mood induction group was measured at baseline and post-activity. Because the no mood induction group was considered to be neutral in mood, their baseline scores were compared with the other two groups post-mood induction scores for analyses. Baseline measurements for all groups were utilized to determine whether the groups were equivalent at the beginning of the experiment and to examine whether the mood manipulations were effective in the positive and negative mood groups. The post-mood induction mood measurement was obtained as a manipulation check of the mood induction procedure.

After testing for baseline differences, all subsequent analyses examined changes in mood from the post-mood induction mood measurement to the post-activity mood measurement. In essence, the post-mood induction mood measurement was considered a second baseline measurement from which changes in affect could be examined. This measurement was performed immediately after the mood induction, which is considered critical because experimentally induced mood states are assumed to be relatively short lived, lasting approximately 10-15 minutes (Gerrads-Hesse, Spies & Hesse, 1994).

Hypotheses

Study Aim One: To assess whether overeating a palatable food (pizza) changes affect relative to distraction and waiting.

Hypothesis 1. Participants in the negative mood and overeating condition were expected to experience the greatest decrease in negative affect and increase in positive affect. Affect was measured by the depression and vigor subscales of the Profile of Moods States- Short Form (POMS-SF). It was expected that these participants would exhibit higher vigor and lower depressed mood (as evidenced by the Vigor and Depression subscales of the POMS-SF) after the eating activity.

1a. Changes in affect among those who received the negative mood induction were expected to be greatest in the Negative Mood-Overeating Group compared to the Negative Mood-Task and the Negative Mood-Wait Groups from post-mood induction to post-activity.

1b. Changes in affect among those who ate the meal were expected to be greatest in the Negative Mood Overeating Group compared to the Positive Mood-Overeating Group and the Neutral Mood-Overeating Group from post-mood to post-activity.

1c. When mood was not experimentally induced, that is, among the Neutral Mood-Overeating, Neutral Mood-Task and the Neutral-Mood Wait groups, consumption of a meal was expected to result in higher vigor and lower depressive mood as compared to a distraction task or a wait control period from post-mood to post-activity.

Study Aim Two: To examine whether change in self focus is the mechanism for affect change.

As stated in hypothesis one, participants exposed to the negative mood induction who ate the meal were expected to experience greater changes in affect than all other groups. A potential mechanism for these changes in affect may be a change in self focus. This phenomenon has been termed an escape from negative self awareness in binge

eaters (Heatherton & Baumeister, 1991). Additionally, depressive affect has been linked to increased self-focused attention (Mor & Winquist, 2002). The "d" scores represent the difference between self-focused attention "S" and externally focused attention "E," with higher "E" scores resulting in lower "d" scores.

2a. Regardless of mood group, it was expected that participants in the Overeating activity would decrease in self-focus "d" scores from post mood induction to post-eating. Participants in the task and wait activities were not expected to change in self focus scores during this time because affect was expected to be stable across these activities.

2b. A significant three-way interaction was expected on self focus difference "d" scores between mood group (negative, positive, neutral), activity (meal, task, and wait) and time (post-mood induction to post-activity) such that the Negative Affect-Overeating Group had the greatest changes in "d" scores.

METHOD

Participants

Participants were 144 college-aged women recruited to participate in a study on food and performance. All participants were recruited from announcements in an undergraduate Psychology course from a university in the eastern United States.

Velten Mood Induction

The Velten mood induction (Velten, 1968), which is classified as an experimental mood induction procedure, was used in this study to induce positive or depressed mood in participants. The Velten technique requires a participant to read a series of 60 statements printed on individual index cards once quietly to themselves, then aloud to the

research assistant. The research assistant flipped to the next card for the participant after each statement was read aloud. Participants in the positive mood group read statements such as "I feel great," whereas participants in the negative mood group read statements such as "Life seems too much for me anyhow, my efforts are wasted." The instructions provided specific instructions to help participants experience the desired mood state, such as instructing them to try to feel the mood suggested by the statements and to try to get deeper into the mood with each new card. The Velten procedure has been shown to induce consistent differences in reported mood states pre- to post-induction (Strickland, Hale, & Anderson, 1975; Velten, 1968). The Velten mood induction has been reported to provoke a moderate level of depressed mood equivalent to an intermediate clinical level (Clark, 1983).

Eating, Distraction, and Waiting Activities

In the overeating activity, the participants were asked to try to finish the cheese pizza (810 kcals) presented to them. They also were provided with a 12 ounce soda (Coke or Sprite). They were left alone in the study room for a period of 15 minutes. If they finished early, then they were asked to sit quietly and wait for the next part of the experiment to begin. In the distracting task activity, participants were given five sheets of paper with different tasks. Two tasks were simple math problems (e.g., addition, subtraction, multiplication of simple numbers) and the other pages were letter finds, involving locating and circling various target letters or symbols from among an arrangement of multiple letters and symbols. For example, they were asked to find and circle all of the letter "As" on one page of paper that contained a random assortment of all the letters in the alphabet. Again, the participants were left alone in the room and

asked to work as "quickly and accurately" as possible for 15 minutes. They were told that they did not have to finish, but if they did finish early, to please sit quietly and wait for the next part of the experiment to begin. The waiting activity involved asking participants to please "sit quietly and wait for the next part of the experiment to begin." The participants were left alone in the room and were reminded that they were not to do any other tasks (such as reading or talking on a cellular phone) while they waited. The experimenter left the room and after 15 minutes passed, returned to the room with the series of measures.

Measures

Three-Factor Eating Questionnaire (TFEQ). The TFEQ (Stunkard and Messick, 1985), which consists of 51 items divided between three subscales (i.e., dietary restraint, hunger, and disinhibition), was used to measure dietary restraint level. Only the restraint subscale, which measures cognitive restraint and conscious attempts to monitor and limit food intake, was used in this study. The restraint subscale is a 21-item scale that contains a mixture of true/false and multiple choice questions, and is reported to measure short-term caloric restriction, although those participants scoring high on this scale may not be in a hypocaloric state (Gorman & Allison, 1995; Heatherton et al., 1988; Lowe, 1993).

In a series of factor analyses on the TFEQ, the restraint factor was quite robust (Allison, 1995). The restraint subscale correlates negatively with the TFEQ disinhibition scale (r = -0.37; Westenhoffer, 1991), and positively with the hunger scale (r = 0.64; Simmons, 1991), the drive for thinness subscale, and the body dissatisfaction subscales of the Eating Disorders Inventory (Garner, Olmsted & Polivy, 1983) discussed below.

Unrestrained eaters (n = 62) have been reported to have a mean score of 6.0 $\pm$ 5.5 (Stunkard & Messick, 1985), whereas American college students (n = 901) scored slightly higher, on average, with a mean of 9.0 $\pm$ 5.8 (Allison et al., 1992). Further breakdown of the college student sample showed that women (n = 617) scored higher, on average, than males (n = 282), with means of 10.2 $\pm$ 5.6 and 6.1 $\pm$ 5.1, respectively (Allison et al., 1992).

Profile of Mood States-Short Form (POMS-SF). The Profile of Mood States (POMS) (Lorr and McNair, 1971) is a commonly used measure of psychological distress measuring subjective mood states, such as anxiety, tension, vigor, depression, fatigue and confusion. A Total Mood Disturbance score (POMS TMD) may be obtained by summing the five scores on the Tension, Depression, Anxiety, Fatigue and Confusion subscales and subtracting the score on the Vigor subscale. A shorter, 37-item version, called the Profile of Moods States-Short Form (POMS-SF; Shacham, 1983) has been shown to have comparable internal consistency estimates to the original POMS. It consists of 37 adjectives describing feelings and mood (e.g. worn-out, energetic, and resentful). Participants are asked to rate each item on a Likert-type scale that best corresponds to their feelings at the time of the assessment from 1 (not at all) to 5 (extremely). In a study of 600 respondents representing five different clinical samples and one sample of healthy adults, correlations between total mood disturbance and subscale scores on the POMS-SF and those from the original POMS all exceeded 0.95 (Curran, Andrykowski, & Studts, 1995). In the current study, the POMS-SF was used to measure current mood, mood changes over time and across activities, and as a manipulation check following the mood induction.

Eating Disorders Inventory (EDI). The EDI (Garner, Olmsted, & Polivy, 1983) is a widely-used measure of symptoms associated with anorexia nervosa and bulimia nervosa (Garner, 1991; Garner & Olmsted, 1984, 1986). The EDI is comprised of 64 self-report items organized into eight subscales, which are designed to assess symptoms common in anorexia and bulimia nervosa (Garner et al., 1983). The subscales of the EDI include: Drive for Thinness (DT; excessive concern with dieting, preoccupation with weight, extreme pursuit of thinness); Bulimia (BUL; tendency to engage in bingeing that may be followed by an impulse to induce vomiting); Body Dissatisfaction (BD; dissatisfaction with the shape of body parts such as hips, and buttocks and the belief that these parts are too big or fat); Ineffectiveness (INEFF; feelings of general inadequacy, insecurity, worthlessness and not being in control of one's life); Perfectionism (PERF; excessive personal expectations of superior achievement); Interpersonal Distrust (ID; sense of alienation and general reluctance to form close relationships); Interoceptive Awareness (IA; lack of confidence in recognizing and accurately identifying emotions or visceral sensations of hunger or satiety); and Maturity Fears (MF; a wish to retreat to the security of preadolescence because of being overwhelmed by the demands of adulthood).

Item scoring treats the 6-point frequency scale as a "0" to "3" (where "never," "rarely" and "sometimes" = 0; and "often" = 1; "usually" = 2; and "always" = 3). Participants are asked to rate the statements on a scale from 1 (always) to 6 (never). The EDI has demonstrated good internal consistency reliability with alpha coefficients ranging from 0.83 to 0.93 across the eight subscales. The EDI also discriminates well between eating-disordered and non-patient samples. Construct validity for the EDI is also supported by strong correlations between the EDI subscales and high correlations

between the EDI and the EAT26 and the Restraint Scale for Eating Disorder Patients (Garner, 1991). This questionnaire was included at baseline measurements only because the psychological characteristics and symptoms associated with anorexia and bulimia nervosa were not expected to change during the experiment.

Beck Depression Inventory (BDI). The BDI (Beck & Steer, 1987) is a 21-item questionnaire that takes 5-10 minutes to complete. The questions assess the severity of the cognitive, behavioral, affective, and physiological symptoms of depression. For each item, respondents select a description that describes personal experience over the past 2 weeks from four responses of increasing severity. The mean coefficient alpha for nonpsychiatric populations is 0.81 (Beck, Steer, & Garbin 1988; Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995). Although the more recent, second edition of this questionnaire (BDI-II; Beck, Brown, & Steer, 1996) was not used in this study, the scores between the two measures have been shown to be highly correlated in outpatient populations (r = 0.93; Beck et al., 1996). The following cut-off scores were used for screening purposes: none or minimal depression <10, mild-to-moderate depression = 10 - 18, moderate-to-severe depression = 19 - 29, and severe depression = 30 - 63.

Self Focus Completion Scale (SFCS). The SFCS (Exner, 1973) is a set of 30 sentence fragments that are scored according to six categories: Self-Focus, External World Focus, Neutral, Ambivalence, Negative Self Focus, External World Focus-Affective. Participants were instructed to complete sentences beginning with phrases such as “I think…,” “If I only would…,” and “It’s fun to daydream about...” This scale is used as a measure of egocentricity or self-centeredness, which can be defined as an imbalance between self-focus (S) and focus in the external world (E). Excessive self

focus has been considered a component of depressive rumination (Ingram, 1990). A difference score between S and E (S – E) is labeled the egocentricity index (d), which measures egocentricity balance or imbalance.

In accordance with Exner and others (Flanagan, 1992), difference scores less than or equal to 1 are considered non-egocentric (or balanced) and difference scores greater than 1 indicate egocentricity (or imbalanced). Exner noted that in the nonpsychiatric population, there is a general balance found between S and E, whereas in the psychiatric population (including individuals with depression and schizophrenia), there was a greater tendency for imbalance. Further, when the ratio between S and E was unequal, less effective behaviors were noted. Interrater reliability has been reported to range from 0.81 to 0.94 when scored by six graduate students, suggesting that although inter-scorer differences exist, these differences are within acceptable limits (Exner, 1973). Exner administered the SFCS to a total sample of 2,592 non-psychiatric individuals (approximately half male and half female) to determine reference scores against which others might be compared. In that study, neutral responses comprised the largest single group of answers with the other categories of Self Focus Negative, Ambivalence, and External World Focus-Affective appearing, on average, once or less per questionnaire.

*Procedure*s

Participants for this study were recruited from introductory Psychology courses at a University in the mid-Atlantic region. A brief description of the study was presented at the beginning of class, and those who indicated an interest in participating were phoned by research assistants and screened prior to participation.

During the phone screen, participants were told that the purpose of the study was to examine the effect of food on performance of mental tasks. They were told that if they agreed to participate, they would be asked to attend a 1 ½ to 2 hour session and would be paid $15 for participating or would receive one additional extra credit point. In addition, all participants also were entered into a $50 prize raffle drawn at the end of each semester. Participants also were told that because they would be asked to eat as part of the study, they should eat a regular meal (e.g., breakfast, lunch) 4 hours before the scheduled meeting time. Each participant was screened for food allergies and lactose intolerance. Participants endorsing an allergy to lactose or any ingredient of cheese pizza were excluded from participation. For those agreeing to participate, a meeting time was set and participants were given a reminder phone call the night before participation by a project assistant.

Upon arrival to the session, participants were randomized to one of nine conditions (one of three mood inductions followed by one of three activities) by use of a random number generator. All participants were read the study description again and asked to sign a consent form. A copy of the consent form was provided to all participants, and they were instructed that they could leave the study at any time without penalty. Dependent upon the condition to which he/she was assigned, the order of procedure varied, but included the following aspects. All participants were asked to verify that they had not eaten within the past 4 hours. Participants who endorsed eating within that time frame were asked to reschedule their session for a later date.

The POMS-SF was used to measure change in self-reported mood and was given at three time points to those participants randomly assigned to one of the mood induction

groups: upon arrival (baseline), after the mood induction (post-mood induction), and after the meal/task/wait activity (post-activity). For those assigned to the no mood induction group, the measures were given only twice: at baseline and after the meal/task/wait activity (post-activity). Because of the different number of assessments given to the mood induction groups, all analyses were performed from post-mood to post-activity for the mood induction groups and from baseline to post-activity for the no mood induction group. Because the mood induction procedure was meant to establish a mood baseline of either positive or negative mood for the mood induction groups, it was assumed that the no mood induction group would have a neutral baseline mood. During baseline, all participants were given the full battery of questionnaires described above. During the post-mood induction measurement and during the post-activity mood measurement, participants only were given the POMS-SF and the SFSC measures.

A debriefing session followed the completion of the study during which participants were told that purpose of the study was to examine the impact of overeating on mood. Participants were asked to keep the nature of the study confidential to avoid contamination of future participants' responses.

RESULTS

Demographics and Baseline Mood Reports Table 1 presents overall demographic information for the 144 female participants including weight, BMI, age, and ethnicity (see Table 1). The typical participant was a nonsmoking, 18-year-old, Caucasian female weighing approximately 131 lbs., with a mean BMI of 23.21(SD= 4.91), which is

considered normal weight (NHLBI, 2004). The majority of the sample was Caucasian (72.2%), and 13.9% of participants selected the "other" ethnicity category or did not choose to select an answer. Table 2 presents demographic information on participants by the mood induction groups and activities (see Table 2) and Table 3 presents baseline information including BDI and BAI scores, self focus scores, and measures of restraint by the mood induction groups and activities (see Table 3).

Baseline differences in weight, BMI, age, BDI, and self focus scores were examined using 3 (mood induction: positive, negative, no mood) by 3 (activity: overeating, distracting task, waiting) ANOVAs. There were no significant interactions for weight, BMI, self focus "d" scores, BDI, and age (all *ps* = ns). Chi-square analyses were used to compare the mood induction and activity groups on ethnicity. There were no significant differences in ethnicity between the mood induction or the activity groups (all *ps* = ns).

Univariate ANOVAs were also used to examine baseline differences between the mood induction/activity groups on the POMS-SF total mood disturbance, BDI, BAI, and dietary restraint as measured by the body dissatisfaction and drive for thinness subscales of the EDI (Garner, Olmsted, & Polivy, 1983). A MANOVA was used to examine baseline mood group by activity differences on each of the POMS-SF subscales. There were no significant mood group by activity interactions for any of these measures (all *ps* = ns), suggesting that participants in all mood groups and activities scored similarly on these measures. The mean score on the BDI (mean = 7.08, SD = 5.81) suggests that participants, on average, had no or minimal depressive symptoms (using a cutoff score of <10 for this category). The mean score on the BAI (mean = 10.21, SD = 8.46) is

descriptively higher than the mean score of 6 with a standard deviation of 8 reported for non-disordered populations (Gillis, Haaga, & Ford, 1995), suggesting that our sample may have been experiencing some anxiety. Participants' mean restraint score of 6.77 (SD = 3.59), is similar to Garner and colleagues' (1983) norms for free eaters, suggesting that this sample was unrestrained.

At baseline (pre-mood induction), self focus difference scores (d) did not differ by activity ($F_{(2,91)} = 0.43$, $p = 0.66$), nor by mood group ($F_{(2,91)} = 0.39$, $p = 0.67$;), suggesting that the groups and activities were comparable in self focus at baseline. Means for self-focus difference scores can be seen in Table 7 (see Table 7). The mean self focus difference (d) score, collapsed across groups and activities was 5.75 (SD = 4.22). The mean baseline self focus S score was 11.61 (SD = 3.10) and the mean baseline E score was 5.70 (SD = 2.84) when collapsed across groups and activities. There were no significant differences between groups or activities at baseline S or E scores (both *p's = ns*). The means from this sample were more unbalanced than those reported in the initial Exner (1973) study, which led to larger self focus difference (d) scores. Exner (1973) reported d scores with a mean of 0.9 in his non-psychiatric sample of over 2,500 people. However, a study by Rabinowitz (1976) reported S and E scores very similar to the means of this study [mean = 15.71 (SD = 3.49); mean = 8.71 (SD = 2.85), S and E, respectively] in a sample of male college freshmen and sophomores. Calculating d scores from Rabinowtiz's study (1976) would yield a d score of 7, which is similar to the present mean d score of 5.75. Table 3 displays the baseline characteristics of the sample, including BDI, BAI, restraint, and self focus "s" scores and "e" scores (see table 3).

Mood Manipulation

Mood induction manipulation check. To examine whether the mood induction worked, mood changes were examined using a 2 (mood induction group: positive, negative) x 2 (time: baseline to post mood induction) repeated measures ANOVA for total mood disturbance and a 2 x 2 repeated measures MANOVA for the POMS-SF subscales. Table 4 presents mean scores on each POMS-SF subscale at baseline and immediately following the mood induction procedure for participants in the Velten Positive and Velten Negative groups (see Table 4). Because the no mood induction group did not receive a mood induction, this group was not included in these analyses.

There was a significant mood induction group by time interaction ($F_{(1,140)} = 34.97$, $p < 0.01$) for the POMS-SF total mood disturbance score. For each of the POMS-SF subscales, significant group by time interactions were found (depression $F_{(2,140)} = 15.53$, $p < 0.01$; tension $F_{(2,140)} = 5.87$, $p < 0.01$; vigor $F_{(2,140)} = 24.9$, $p < 0.01$; anger $F_{(2,140)} = 14.02$, $p < 0.01$; confusion $F_{(2,140)} = 16.19$, $p < 0.01$; fatigue $F_{(2,140)} = 18.74$, $p < 0.01$). To test the main effect of mood induction at each time point, mood induction groups were compared at baseline on the POMS-SF total mood disturbance score and the subscales, however no significant differences were found. At post-mood induction, the groups differed in the total mood disturbance score $F_{(2,142)} = 8.20$, $p < 0.01$ and on all subscales except tension (depression $F_{(2,140)} = 11.24$, $p < 0.01$; tension $F_{(2,140)} = 2.20$, $p = 0.11$; vigor $F_{(2,140)} = 5.69$, $p < 0.01$; anger $F_{(2,140)} = 4.54$, $p < 0.05$; confusion $F_{(2,140)} = 5.68$, $p < 0.01$; fatigue $F_{(2,140)} = 3.74$, $p < 0.05$). For participants in the Negative mood induction group, there were significant increases on the depression and fatigue subscales from pre to post mood induction. There were also significant decreases on the Vigor subscale, where

decreases in scores represent a worsening of mood. For those in the Positive mood induction group, there were significant decreases on every negative affect subscale (depression, fatigue, tension, anger, and confusion). However, there were no significant changes on the vigor subscale for this group. Figure 1 displays the scores at baseline and post-mood induction for both the positive and negative mood induction groups (see Figure 1). Thus, overall, the mood induction appeared to be successful.

Hypothesis 1: Does overeating a palatable food change affect?

1a. A 3 (activity: meal, task, wait) x 2 (time: post-mood to post-activity) repeated measures MANOVA revealed no significant overall activity by time interaction among participants who received the negative mood induction ($F_{(4,104)} = 0.38$, p = ns). Univariate tests revealed no significant activity by time interactions on depression or vigor ($F_{(2,52)} = 0.29$, p = ns; ($F_{(2,52)} = 0.16$, p = ns), respectively.

1b. A 3 (mood group: negative, positive, neutral) x 2 (time: post-mood to post-activity) repeated measures MANOVA revealed a significant overall mood group by time interaction among participants who ate the meal ($F_{(4,90)} = 2.79$, $p < 0.05$). Univariate tests revealed no significant changes for depression over time ($F_{(2,45)} = 0.91$, p = ns) but there were significant changes in vigor over time ($F_{(2,45)} = 5.96$, $p < 0.01$). Subsequent paired t-tests revealed a significant decrease in vigor for those in the positive mood group ($t(15) = 2.35$, $p < 0.05$), no significant changes in vigor for those in the negative mood group ($t(15) = -2.00$, p = ns), and a significant decrease in vigor for those in the neutral mood group ($t(15) = 2.11$ $p = 0.05$).

1c. A 3 (activity: meal, task, wait) x 2 (time: post-mood to post-activity) repeated measures MANOVA revealed no significant overall activity by time interaction among

participants in the neutral mood group ($F_{(4,82)} = 1.13$, p = ns). Univariate tests revealed no significant activity by time interactions on depression or vigor ($F_{(2,41)} = 2.02$, p = ns; ($F_{(2,41)} = 0.16$, p = ns), respectively.

Hypothesis Two: Change of self focus as a mechanism for affect change.

2a. A 3 (activity: meal, task, wait) by 2 (time: post-mood to post-activity) repeated measures ANOVA revealed no significant activity by time interaction on self focus "d" scores ($F_{(2,77)} = 1.23$, p = ns).

2b. A 3 (activity: meal, task, wait) x 3 (mood group: positive, negative, neutral) x 2 (time: post-mood to post-activity) repeated measures ANOVA revealed no significant mood group by activity by time interaction on self focus "d" scores ($F_{(2,71)} = 0.16$, p = ns).

DISCUSSION

The purpose of the present study was to examine the impact of overeating on mood among 144 female college students. It is often assumed that eating necessarily results in a more positive affect because negative mood is a common antecedent to a binge (Abraham & Buemont, 1982; Johnson-Sabine, Wood & Wakeling, 1984; Schlundt, Johnson, & Jarrell, 1985). This conclusion, however, has rarely been empirically tested.

The aim of this study was to test this hypothesis and determine if overeating changed affect. Both affect and eating were manipulated. Two non-eating activities were used as control conditions; change in affect after overeating was compared to these conditions in order to determine if distraction or the passage of time altered affect. Self-focused attention was examined because overeating was expected to change affect

through a change in self focus. Specifically, overeating was expected to remove self focus and create an external focus, which is a process similar to the escape from negative self awareness which is described in binge eaters (Heatherton & Baumeister, 1991). It was expected that this same change away from self focus would be experienced by all participants in the meal activity, regardless of mood group.

More specifically, participants who agreed to participate filled out questionnaires to establish baseline levels of eating restraint, mood, anxiety, and self focused attention. Then, participants were randomly assigned to one of nine mood group-activity assignments. The mood groups consisted of a positive mood group, a negative mood group, and a neutral mood group. The Velten Mood Induction technique was used to establish the positive and negative moods; no mood induction was given to the neutral group. Within each mood group, there were three activity groups: overeating, performing a distracting task, or waiting. Changes in mood and in self-focused attention were measured after the mood induction and after completion of the overeating, distraction, or waiting activities.

The typical participant was an 18 year old normal weight (mean BMI = 23.21) non-smoker; the majority of the sample was Caucasian. There were no significant demographic or baseline mood, self focused attention, or anxiety score differences among the groups, suggesting the groups were similar at baseline. The mood induction appeared to be successful in that it did produce small, but statistically significant changes in mood in the expected directions.

Contrary to the hypotheses, overeating did not result in positive mood change for participants exposed to the negative mood induction; mood also was not improved after

the distraction and waiting conditions. However, a significant interaction of mood group by time revealed that for participants who ate the meal, there were significant decreases in Vigor for those who had received the positive mood induction or were neutral in mood. No changes were found for those in the negative mood group who ate the meal. Finally, contrary to the hypotheses, there were no significant changes in self focused attention scores over time, for any group.

Although the hypotheses for the most part were not supported, this study made several major contributions to the literature. One of the major contributions is conceptual. Past research has traditionally examined the impact of mood on eating, with the amount eaten conceptualized as a dependent variable. The present study examined the impact of overeating on mood from an affect-regulation perspective, with overeating viewed as an independent variable. This study also made an important methodologic contribution – it focused on overeating, as opposed to regular eating or snacking, and operationalized overeating as consumption of an entire cheese pizza. This distinction between eating and overeating is important because overeating is the behavior generally reported clinically by individuals engaging in stress-induced eating. Similarly, clinically, individuals report overeating highly palatable foods. Pizza is considered both a highly palatable food and a food commonly eaten by college students. The majority of past studies have used bland foods, such as crackers, that are not typically associated with overeating behavior.

Researchers have suggested that mood may be regulated using a variety of substances (e.g., nicotine) and behaviors (e.g., watching television), and that these methods may be interchangeable, as long as the satisfying mood state occurs (Thayer,

1989; Grunberg, 1982). The present study suggests that eating may regulate affect by blunting affect in general, rather than by affecting positive or negative mood independently. In addition, the findings suggest it is worthwhile to follow up on comparisons between affect reduction achieved through overeating compared to other distracters. More broadly, our findings that overeating did not differ from distraction or time passage in its effects on affect regulation in the short term suggests that more attention should be given to the use of distraction activities in weight loss programs.

These results indicate that self focus did not change depending on mood group assignment or on activity assignment. Considering the literature that consistently shows increased self focus is associated with negative affect (Mor & Winquist, 2002), these results were somewhat surprising. Further, because a change in self awareness has been suggested to occur in binge eaters (Heatherton & Baumeister, 1991), it was expected that the act of overeating would cause a change in self focus. However, it is important to note that this sample was self-focused at baseline. Therefore, increased self-focus may not have been feasible (i.e., because of a ceiling effect).

It also may be that self focus is an important affect-regulating process in clinical samples, but not in non-clinical samples, such as the one used in this study. For example, it is possible that self focus in a non-clinical sample is not subject to the same types of changes that occur in binge eaters or other clinical samples. It would be interesting to replicate this study with clinical samples, such as binge eaters or those with diagnosed eating disorders, to determine the relationship between self focus and affect regulation after overeating. Because of the limitations of the present study (addressed below), it is

premature to eliminate the self focus mechanism as an interesting and important area of investigation.

Limitations

There are several limitations to this study. First, the sample consisted of college-aged women, limiting the generalizability of these results to college females. It also is important to note that our sample had an overall low level of dietary restraint – further evidence that they were not representative of a clinical population. In addition, we asked participants to eat a whole pizza -- 810 calories and 27 fat grams during a 15 minute time span. And although very few of the participants left any food on the plate, many reported feeling extremely full after the overeating task. Thus, our goal of inducing an overeating episode was accomplished; however, being asked to overeat by the experimenter is clearly different than overeating by choice. Therefore, it is possible that this procedure did not induce the same affective components as a binge episode.

The methodological issues include the length of the study combined with the repeated measures during the study that may have caused fatigue among participants. Participants were given the same battery of questionnaires three times during their 1.5 hour visit to the lab. Many participants noted that the measures were repetitive and uninteresting, and it is possible that fatigue and/or boredom interfered with accurate responding over time. Particularly on the self focus sentence completion scale, where participants are required to finish sentence stems, we noticed that responses tended to get shorter over time, possibly indicating fatigue. Therefore, it is possible that the lack of findings using the self focus was a result of the repeated use of the scale in such a short period of time.

Another limitation of the study may have been the choice of distracting task. Although the task consisted of simple math problems and letter finds, many participants did not complete the task in the 15-minute time period. This inability to finish the task may have had a negative effect on participants' moods. Anecdotally, several participants questioned the researchers regarding whether they had performed successfully on the task. It is possible that our college student sample, accustomed to being tested and receiving grades, did not experience the task as neutral. That is, this sample may have attributed more importance to "success" on the task than intended, which may have affected the results.

Similarly, the alone wait activity, in which participants were asked to sit in the lab room for 15 minutes while the researcher "prepared the next part of the study," may not have been a neutral wait time. Originally, it was assumed that this wait period would serve as a control activity to determine whether any changes in affect over time were a result of the meal activity rather than the passage of time. However, it was noted that several participants did not follow the instructions to simply wait and instead engaged in other activities during the 15 minute wait period (e.g., reading, talking on a cell phone). Thus, for some participants the wait period included distracting activity.

The Velten mood induction technique, which is commonly used for mood induction purposes, produced some statistically significant changes in affect in our group of college females. This method of the participant reading statements to themselves and then aloud has been shown to induce mood (either elation or depression) in some people. Although the Velten procedure has been reported to produce depression scores in the intermediate clinical level (Clark, 1983), in the present study changes in affect were

relatively small (although in the correct direction). It is possible, therefore, that insufficient mood change occurred from which to then demonstrate a second change.

It may be that other methods of mood induction could have produced greater affect changes. Other methods include success or failure on tasks and emotional recall, in which subjects are asked to remember autobiographical events that provoke certain moods, e.g., loneliness, rejection, frustration, hurt. Also, the use of emotional movie segments is becoming more common in the literature as a means of inducing mood (Macht et al., 2002). A recent review of mood induction techniques concluded that film or story mood induction techniques should be chosen above other techniques, such as the Velten (Gerrads-Hesse, Spies & Hesse, 1994). Further, all types of mood inductions are relatively short-lived. In fact, recent meta analyses have revealed that the average length of mood changes following a mood induction is between 10-15 minutes. Therefore, any mood measurements taken during this time period may reflect only return to baseline mood.

Summary

Our goal in this study was to begin to understand the function of food to regulate mood by examining changes in mood after overeating and comparing those changes to changes after a distracting task and a waiting activity. The impact of overeating on mood was addressed from an affect regulation perspective because much of the past work in this area has not addressed the consequences of overeating on mood. Instead, there has been a heavy emphasis on the antecedents to eating and overeating. Findings suggest that mood changes after overeating are complex. Participants in a positive or neutral mood who ate the meal decreased in positive affect. However, those in a negative mood

who ate the meal did not change in positive affect. No changes were found for negative affect, which contradicts much past work. Whereas negative mood is commonly reported to be an antecedent to overeating or bingeing, it appears that negative mood is not changed (i.e., relieved) after overeating.

These findings call into question the utility of overeating as a mood regulating behavior. If overeating does not change negative mood, then one may wonder why so many individuals report overeating in response to negative mood. From a basic mood regulation and learning theory perspective, it was expected that overeating would make participants feel "better," by decreasing negative affect (i.e., depression scores) and increasing positive affect (i.e., vigor scores). The fact that vigor was decreased for some participants after eating, and that no participants had decreased depression scores after eating, was surprising. The use of a non-restrained, non-clinical college sample may have impacted these results, as much past work has been done with clinical samples. Additionally, the findings that self focused attention did not change among individuals may be, in part, explained by the fact that the observed mood changes, although statistically significant, were clinically quite small. Perhaps in order for self focused attention changes to be noticed, mood changes would have to be more salient.

Although many of the proposed hypotheses were not supported, this study provided an important conceptual contribution to the mood-regulation and food literature by examining the effects of overeating on mood rather than the effects of mood on overeating. Results suggest that effects of overeating on mood are complex. Further research is necessary to better understand how overeating might regulate mood in non-clinical as well as clinical populations.

REFERENCES

Abraham, S.F., Beumont, P.J. (1982). How patients describe bulimia or binge eating. *Psychological Medicine, 12* (3), 625-635.

Agras, W.S. & Telch, C.F. (1998). The effects of caloric deprivation and negative affect on binge eating in obese binge-eating disordered women. *Behavior Therapy,29(3),* 491-503.

Allison, D.B., Kalinsky, L.B., & Gorman, B.S. (1992). The comparative psychometric properties of three measures of dietary restraint. *Psychological Assessment, 4,* 391-198.

Allison, D.B. (1995). *Handbook of assessment methods for eating behaviors and weight-related problems: Measures, theory, and research*. Thousand Oaks, CA: Sage Publications.

American Psychiatric Association Work Group on Eating Disorders. *Practice guideline for the treatment of patients with eating disorders (revision).* (2000). American Journal of Psychiatry,*157* (1 Suppl): 1-39.

Arnow, B., Kenardy, J., & Agras, W.S. (1995). The emotional eating scale: The development of a measure to assess coping with negative affect be eating. *International Journal of Eating Disorders, 18,* 79-90.

Bandura, A. (1977). *Social Learning Theory*. New York: General Learning Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Bandura, A. (1999). Social cognitive theory of personality. In Pervin, L.A. & John, O.P. (Eds.) *Handbook of personality: Theory and research* (2nd edition, pp.154-196). New York, NY: The Guilford Press.

Beck, A. T., Brown, G., & Steer, R. A. (1996). *Beck Depression Inventory II manual*. San Antonio, TX: The Psychological Corporation.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56,* 893-897.

Beck, A. T., & Steer, R. A. (1987). *BDI, Beck Depression Inventory: Manual*. San Antonio, TX: Psychological Corporation.

Beck, A. T., & Steer, R. A. (1990). *The Beck Anxiety Inventory*. Austin, TX: The Psychological Corporation.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory (2nd ed. Manual).* San Antonio, TX: The Psychological Corporation.

Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8,* 77-100.

Brosse, A.L., Sheets, E.S., Lett, H.S., Blumenthal, J.A. (2002) Exercise and the treatment of clinical depression in adults: recent findings and future directions. *Sports Medicine,32*(12), 741-60.

Brownell, K.D., & Rodin, J. (1994). Medical, metabolic, and psychological effects of weight cycling. *Archives of Internal Medicine, 154,* 1325-1330.

Carr, S. J., Teasdale, J. D., & Broadbent, D. (1991). Effects of induced elated and depressed mood on self-focused attention. *British Journal of Clinical Psychology, 31*, 273–275.

Carver, C. S., & Scheier, M. F. (1977). Self-focused attention and the experience of

emotion: Attraction, repulsion, elation and depression. *Journal of Personality and Social Psychology, 35* (9), 625-363.

Carver, C. S., & Scheier, M. F. (1981). *Attention and self-regulation: A control therapy approach to human behavior*. New York: Springer Press.

Clark, D.M. (1983). On the induction of depressed mood in the laboratory: Evaluation and comparison of the Velten and musical procedures. *Advances in Behavior Research and Therapy, 5,* 27-49.

Cools, J., Schotte, D.E. & McNally, R.J. (1992). Emotional arousal and overeating in restrained eaters. *Journal of Abnormal Psychology, 101* (2), 348-351.

Curran, S. L., Andrykowski, M. A., & Studts, J. L. (1995). Short Form of the Profile of Mood States (POMS-SF): Psychometric information. *Psychological Assessment, 7,* 80-83.

Dubbert, P.M. (2002). Physical activity and exercise: Recent advances and current challenges. *Journal of Consulting & Clinical Psychology,* 70(3), 526-536.

Exner, J.E., Jr. (1973). The Self Focus Sentence Completion: a study of egocentricity. *Journal of Personality Assessment, 37* (5), 437-55.

Flanagan, R. (1992). Shyness, egocentricity, and psychopathology: Their relationships among nonhospitalized individuals and mental health patients. *Psychological Reports, 70*, 995-1004.

Ganley, R.M. (1989). Emotion and eating in obesity: A review of the literature. *International Journal of Eating Disorders, 3*, 343-361.

Garner, D. M. (1991). *Eating Disorder Inventory 2: Professional manual*. Odessa, FL:

Psychological Assessment Resources, Inc.

Garner, D. M., & Olmsted, M. P. (1984). T*he Eating Disorder Inventory Manual*. Odessa, Florida: Psychological Assessment Resources.

Garner, D. M., & Olmsted, M. P. (1986). More on the Eating Disorder Inventory. *American Journal of Psychiatry*, *143*, 805 806.

Garner, D.M., Olmsted, M.P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, *2*, 15-34.

Geliebter, A. & Aversa, A. (2003). Emotional eating in overweight, normal weight, and underweight individuals. *Eating Behaviors, 3,* 341-347.

Gerrads-Hesse, A., Spies, K., Hesse, F.W. (1994). Experimental inductions of emotional states and their effectiveness: a review. *British Journal of Psychology, 85*(1), 55-79.

Gillis, M. M., Haaga, D. A. F., & Ford, G. T. (1995). Normative values for the Beck Anxiety Inventory, Fear Questionnaire, Penn State Worry Questionnaire, and Social Phobia and Anxiety Inventory. *Psychological Assessment, 17*, 450-455.

Glisky, M.L., Tataryn, D.J., Tobias, B.A., Kihlstrom, J.F., & McConkey, K.M. (1991). Absorption, openness to experience, and hypnotizability. *Journal of Personality & Social Psychology, 60*, 263-272.

Gorman, B.S., & Allison, D.B. (1995). Measures of restrained eating. In D. B. Allison (Ed.), *Handbook of assessment for eating behaviors and weight-related problems*. (pp. 149-184). Thousand Oaks, CA: Sage Publishing, Inc.

Green, J.D., Sedikides, C., Saltzberg, J.A., Wood, J.V., & Forzano, L.A.B. (2003).

Happy mood decreases self-focused attention. *British Journal of Social Psychology, 42*, 147-157.

Greeno, G.G. & Wing, R.R. (1994). Stress-induced eating. *Psychological Bulleti*n, *115*, 444-464.

Grunberg, N.E. (1982). The effects of nicotine and cigarette smoking on food consumption and taste preferences. *Addictive Behaviors, 7*(4), 317-331.

Guertin, T.L. & Conger, A.J. (1999). Mood and forbidden foods' influence on perceptions of binge eating. *Addictive Behaviors, 24* (2), 175-193.

Haddock, C.K. & Dill, P.L. (2000). The effects of food on mood and behavior: Implications for the addictions model of obesity and eating disorders. *Drugs & Society*, *15*(1-2), 17-47.

Heatherton, T.F., & Baumeister, R.F. (1991). Binge eating as escape from self-awareness. *Psychological Bulletin, 110*, 86-108.

Heatherton, T., Herman, P., Polivy, J., King, G., & McGree, S. (1988). The (Mis)measurement of restraint: An analysis of conceptual and psycho-metric issues. *Journal of Abnormal Psychology, 97*, 19 –28.

Herman, C. P. & Mack, D. (1975). Restrained and unrestrained eating. *Journal of Personality and Social Psychology, 43*, 647-660.

Herman, C. & Polivy, J. (1975). Anxiety, restraint, and eating behavior. *Journal of Abnormal Psychology, 84*, 666-672.

Herman, C., & Polivy, J. (1980) Restrained eating. In A.B. Stunkard (Ed.) *Obesity*, 208-225. Philadelphia: Saunders.

Herman, C. & Polivy, J. (1984). A boundary model of the regulation of eating. In A.J.

Stunkard & E. Stellar (Eds). *Eating and its disorders*, pp. 141-156. New York: Raven Press.

Izard, C.E., & Ackerman, B.P. (2000). Organizational and motivations functions of discrete emotions. In M. Lewis & J. M. Haviland (Eds), *Handbook of Emotions*, 2nd edn., pp. 253-264. New York: Guilford Press.

Johnson-Sabine, E.C., Wood, K.H. & Wakeling, A. (1984). Mood changes in bulimia nervosa. *British Journal of Psychiatry,145*, 512-516.

Kalupa, K.L., Sbrocco, T., Lewis, E. & Osborn, R.L. (2004). Taste Perception: An Examination of Fat Preference, Sensory Specific Satiety, and the Function of Eating among Overweight and Normal Weight Women. Paper under review.

Kaplan, H.I., & Kaplan, H.S. (1957). The psychosomatic concept of obesity. *Journal of Nervous and Mental Disorders*, 125, 181–201.

Kernardy, J., Bulter, A., Carter, C., & Moor, S. (2003). Eating, mood, and gender in a noneating disorder population. *Eating Behaviors, 4*, 149-158.

Kumanyika, S., Jeffery, R.W., Morabia, A., Ritenbaugh, C., & Antipatis, V.J. (2002). Obesity prevention: The case for action. *International Journal of Obesity, 26*, 425-436.

Larsen, R.J. (2000). Toward a science of mood regulation. *Psychological Inquiry, 11*(3); 130-143.

Larsen, R.J. & Prizmic, Z. (2004). Affect regulation. In R.F. Baumeister & Vohs, K.D. (Eds.), *Handbook of self-regulation: Research, theory, and applications*. (pp.40-61). New York: The Guilford Press.

Lorr, M., & McNair, D. M. (1971). *The Profile of Mood States manual*. San Diego, CA:

Educational and Industrial Testing Service.

Lowe, M.R., Foster, G.D., Kerzhnerman, I., Swain, R.M., & Wadden, T.A. (2001). Restrictive dieting versus "undieting": Effects on eating regulation in obese clinic attenders. *Addictive Behaviors, 26,* 253-266.

Lowe, M.R. & Fisher, E.B. (1983). Emotional reactivity, emotional eating, and obesity: A naturalistic study. *Journal of Behavioral Medicine, 6*(2),135-149.

Lowe, M.R. (1993) The effects of dieting on eating behaviour: a three-factor model. *Psychological Bulletin , 114,* 100-121.

Lyman, B. (1982). The nutritional values and food group characteristics of food preferred during various emotions. *Journal of Psychology, 112,* 121-127.

Lowe, M.R. & Fisher, E.B. (1983). Emotional reactivity, emotional eating, and obesity: A naturalistic study. *Journal of Behavioral Medicine, 6*(2),135-149.

Macht, M., Roth, S., & Ellgring, H. (2002). Chocolate eating in healthy men during experimentally induced sadness and joy. *Appetite, 39,* 147-158.

McKenna, R. J. (1972). Some effects of anxiety level and food cues on the eating behavior of obese and normal subjects: A comparison of the Schachterian and psychosomatic conceptions. *Journal of Personality and Social Psychology, 22,* 311-319.

Mor, N. and Winquist, J. (2002). Self focused attention and negative affect: A meta analysis. *Psychological Bulletin, 128* (4), 638-662.

Morris, W.N. and Reilly, N.P. (1987). Toward the self-regulation of mood: theory and research. *Motivation and Emotion, 11,* 215–249.

National Heart, Lung, and Blood Institute. (1998). *Clinical Guidelines on the*

Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. Department of Health and Human Services, National Institutes of Health. NIH Publication No. 98-4083.

National Heart, Lung, and Blood Institute. (2004). Body Mass Index Table. Retrieved December 20, 2003, from http://www.nhlbisupport.com/bmi/.

National Institutes of Health, United States. (2002). *In Table 70: Healthy weight, overweight, and obesity among persons 20 years of age and over, according to sex, age, race, and Hispanic origin: United States, 1960-62, 1971-74, 1976-80, 1988-94, and 1999-2000.* Retrieved January 10, 2004, from http://www.nih.gov.

Nisbett, R.E. (1968). Taste, deprivation, and weight determinants of eating behavior. Journal *of Personality and Social Psychology, 10,* 107-116.

Pallant, J. (2000). Development and validation of a scale to measure perceived control of internal states. *Journal of Personality Assessment, 75*(2), 308-337.

Patel, K.A. & Schlundt, D.G. (2001). Impact of moods and social context on eating behavior. *Appetite, 36,* 111-118.

Polivy, J., Herman, C. & McFarlane, T. (1994). Effects of anxiety on eating: Does palatability moderate distress-induced overeating in dieters? *Journal of Abnormal Psychology, 103* (3), 505-510.

Reid, M. & Hammersley, R. (1995) The effects of carbohydrates on subsequent food intake and mood state. *Physiology and Behaviour, 58* (3), 421-427.

Reznick, H. & Balch, P. (1977). The effects of anxiety and response cost manipulations on the eating behavior of obese and normal-weight subjects. *Addictive Behaviors, 2*(4), 219-225.

Rogers P.J., Carlyle J., Hill, A.J., Blundell J.E. (1988). Uncoupling sweet taste and calories: Comparison of the effects of glucose and three intense sweeteners on hunger and food intake. *Physiology and Behavior, 43*, 547-552.

Rolls, B.J., Hetherington, M. and Burley, V.J. (1988). Sensory stimulation and energy density in the development of satiety. *Physiology and Behavior, 44*, 727-733.

Ruderman A.J. (1983). Obesity, anxiety, and food consumption. *Addictive Behaviors, 8*(3), 235-42.

Santor, D.A., Zuroff, D.C., Ramsay, J.O., Cervantes, P., & Palacios, J. (1995). Examining scale discriminability in the BDI and CES-D as a function of depressive severity. *Psychological Assessment, 7*, 131-139.

Sbrocco, T. Kalupa, K. L., Stone, J. M., Nedegaard, R.C. & Lewis, E. (1998). Obese women care for others at their own expense. Poster session presented at the annual meeting of Association for the Advancement of Behavior Therapy, Washington, D.C.

Schachter, S., Goldman, R., & Gordon, A. (1968). Effects of fear, food deprivation, and obesity on eating. *Journal of Personality and Social Psychology, 10* (2), 91-97.

Schachter, S. and Gross, L.P. (1968). Manipulated time and eating behavior. *Journal of Personality and Social Psychology, 10* (2), 98-106.

Schacter, S. (1971). *Emotions, obesity and crime*. New York: Academic Press.

Scheier, M.F. (1976). Self awareness, self consciousness, and angry aggression. *Journal of Personality, 44*, 627-644.

Scherer, K.R. & Tannenbaum, P. (1986). Emotional experiences in everyday life: a survey approach. *Motivation and Emotion, 10*, 295-314.

Schlundt, D.G., Johnson, W.G. & Jarrell, M.P. (1985). A naturalistic functional analysis of eating behavior in bulimia and obesity. *Advances in Behaviour Research & Therapy, 7* (3), 149-162.

Schlundt, D.G., Sbrocco, T., & Bell, C. (1988). Identification of high-risk situations in a behavioral weight loss program: application of the relapse prevention model. *International Journal of Obesity, 13*, 223-234.

Schmitz, B.A. (1996). The relationship between affect and binge eating. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *56*, 7055.

Shacham, S. (1983). A shortened version of the Profile of Mood States. *Journal of Personality Assessment, 47*, 305-306.

Shannon, W.R. (1922). Neuropathic manifestations in infants and children as a result of anaphylactic reactions to foods contained in their dietary. *American Journal of Child Diseases, 24*, 89-94.

Simmons, D.D. (1991). Dietary restraint as value-related motivation: A psychometric clarification. *Journal of Psychology, 125*, 189-194.

Slochower, J. (1976). Emotional labeling and overeating in obese and normal weight individuals. *Psychosomatic Medicine, 38*, (2), 131-139.

Slochower, J. & Kaplan, S. P. (1980). Anxiety, perceived control, and eating in obese and normal weight persons. *Appetite, 1*, 75-83.

Stunkard, A.J. & Messick, S. (1985). The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research, 29*, 71-83.

Stunkard, A.J. & Messick, S. (1988). *The Eating Inventory*. San Antonio, TX:

Psychological Corporation.

Swanson, D.W., & Dinello, F.A. (1970). Severe obesity as a habituation syndrome: Evidence during a starvation study. *Archives of General Psychiatry, 22* (2), 120-127.

Thayer, R.E. (1989). *The biopsychology of mood and arousal*. New York: Oxford University Press.

Thayer, R.E., Peters, D.P., Takahashi, P.J. & Birkhead-Flight, A.M. (1993). Mood and behavior (smoking and sugar snacking) following moderate exercise: A partial test of the self-regulation theory. *Personality and Individual Differences, 14* (1), 97-104.

Tice, D.M. & Bratslavsky, E. (2000). Giving in to feel good: The place of emotional regulation in the context of general self-control. *Psychological Inquiry, 11*(2), 149-160.

Tuomisto T, Tuomisto MT, Hetherington M, Lappalainen R. (1998). Reasons for initiation and cessation of eating in obese men and women and the affective consequences of eating in everyday situations. *Appetite, 30* (2), 211-22.

Velten, E. (1968). A laboratory task for induction of mood states. *Behavior Research and Therapy, 6*, 473-482.

Wardle, J. (1980). Dietary restraint and binge eating. *Behavior Analysis and Modification, 4*, 201-209.

Wardle, J. (1990). Conditioning processes and cue exposure in the modification of excessive eating. *Addictive Behaviors, 15* (4), 387-393.

Watson, D. (2000). *Mood and temperament*. The Guilford Press, New York.

Watson, D., & Clark, L.A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology*, *54*, 1063-1070.

Watson, D. and Clark, L.A. (1997). Measurement and mismeasurement of mood: Recurrent and emergent issues. *Journal of Personality Assessment, 68,* 267–296.

Wegner, K.E., Smyth, J.M., Crosby, R.D., Wittrock, D., Wonderlich, S.A. & Mitchell, J.E. (2002). An evaluation of the relationship between mood and binge eating in the natural environment using ecological momentary assessment. *International Journal of Eating Disorders*, *32* (3), 352-361.

Weingarten, H.P. (1984). Meal initiation controlled by learned cues: Basic behavioral properties. *Appetite, 5*, 147–158.

Weingarten, H.P. and Gowans, S.E. (1991). Sensory control of eating: The meal as a stream of sensations. In. T.V. Getchell, R.L. Doty, L.M. Bartoshuk and J.B. Snow (eds*.). Smell and Taste in Health and Disease*. New York: Raven Press, pp. 381-391.

Westenhoffer, J. (1991). Dietary restraint and disinhibition: Is restraing a homogeneous construct? *Appetite, 15*, 45-55.

Wicklund, R.A. (1975). Discrepancy reduction or attempted distraction? A reply to Liebling, Seiler, and Shaver. *Journal of Experimental Social Psychology, 11*, 78-81.

Table 1

Baseline characteristics for the sample (N= 144)

Age (years), M(SD)		18.66 (1.64)
Body Weight (lbs.)		131.22 (23.27)
Body Mass Index (BMI; kg/m^2)		23.21 (4.91)
Ethnicity, No. (%)		
	Caucasian	104 (72.2)
	African American	7 (4.9)
	Asian	7 (4.9)
	Hispanic	5 (3.5)
	American Indian	1 (0.7)
	Other/unknown	20 (13.9)

Table 2

Baseline demographics for mood induction and activity groups

		Mood Induction Group								
		Positive			Negative			No mood		
Activity		OE	DT	WT	OE	DT	WT	OE	DT	WT
	Age M(SD)	18.4 (0.7)	18.8 (1.3)	18.9 (1.1)	18.9 (0.7)	18.2 (0.6)	19.4 (2.7)	18.9 (1.3)	19.1 (3.0)	18.0 (0.4)
	Weight	124.4 (11.9)	137.9 (36.0)	134.0 (30.4)	122.75 (20.1)	131.17 (24.0)	127.6 (12.4)	131.4 (21.2)	139.3 (25.3)	133.3 (15.9)
	Smoker, No. (%)	4 (28)	2 (12.5)	6 (50)	1 (7)	9 (37)	3 (2)	2 (12.5)	1 (6)	1 (8)

* OE = overeating, DT = distracting Task, WT = waiting

Table 3. Baseline characteristics for mood induction and activity groups

		Mood Induction Group								
		Positive			Negative			No mood		
Activity		OE	DT	WT	OE	DT	WT	OE	DT	WT
	BDI M (SD)	7.37 (7.3)	6.0 (4.1)	8.5 (4.9)	7.4 (8.8)	8.3 (6.4)	6.9 (2.3)	7.1 (5.9)	6.4 (5.1)	4.8 (4.3)
	BAI	10.1 (9.1)	9.0 (6.2)	15.2 (10.9)	8.6 (8.5)	8.6 (5.4)	13.3 (9.3)	8.1 (7.0)	11.2 (7.4)	9.3 (12.2)
	Drive Thinness scores	2.8 (3.3)	5.8 (4.2)	4.1 (3.6)	7.3 (11.3)	4.4 (3.4)	6.4 (4.8)	5.3 (4.6)	5.3 (4.3)	4.1 (5.0)
	Self Focus S scores	12.1 (3.1)	11.6 (3.1)	10.7 (3.9)	12.0 (2.8)	11.8 (3.5)	11.1 (2.5)	10.9 (2.7)	11.4 (2.7)	13.0 (3.6)
	Self Focus E scores	5.8 (3.6)	6.1 (2.8)	5.2 (2.8)	6.7 (3.0)	5.0 (2.6)	6.1 (3.1)	5.9 (3.3)	5.2 (2.5)	5.1 (2.3)

Table 4

Velten Mood Induction Manipulation Check

POMS-SF Subscale	Mood Group	Baseline Mean (SD)	Post-Mood Induction Mean (SD)
Depression			
	Positive	1.34 (0.48)	1.14 (0.24)**
	Negative	1.36 (0.53)	1.64 (0.78)**
Vigor			
	Positive	2.01 (0.63)	2.09 (0.69)
	Negative	2.39 (0.93)	1.69 (0.80)**
Fatigue			
	Positive	2.31 (0.91)	1.83 (0.86)**
	Negative	2.04 (0.76)	2.27 (0.89)*
Tension			
	Positive	1.71 (0.63)	1.45 (0.41)**
	Negative	1.67 (0.53)	1.64 (0.67)
Anger			
	Positive	1.41 (0.51)	1.12 (0.28)**
	Negative	1.35 (0.54)	1.43 (0.68)
Confusion			
	Positive	1.73 (0.57)	1.37 (0.37)**
	Negative	1.65 (0.55)	1.69 (0.62)
Total Mood			
	Positive	6.47 (2.56)	4.80 (1.80)**
	Negative	5.69 (2.77)	6.99 (3.07)**

* indicates significant change from baseline to post-mood induction @ $p < 0.05$
** $p < 0.01$

Table 5

Positive Mood Group Mood Change from Post-Mood Induction to Post Activity

POMS-SF Subscale	Activity	Post-Mood Induction Mean(SD)	Post-Activity Mean (SD)
Depression			
	Meal	1.17 (0.27)	1.09 (0.20)
	Task	1.16 (0.28)	1.14 (0.23)
	Wait	1.05 (0.09)	1.09 (0.13)
Vigor			
	Meal	2.19 (0.56)	1.82 (0.57)*
	Task	2.29 (0.72)	2.06 (0.77)*
	Wait	1.69 (0.68)	1.74 (0.64)
Fatigue			
	Meal	1.46 (0.54)	1.56 (0.37)
	Task	2.00 (0.87)	2.00 (0.99)
	Wait	2.05 (1.08)	2.16 (1.14)
Tension			
	Meal	1.45 (0.56)	1.27 (0.42)**
	Task	1.49 (0.42)	1.44 (0.42)
	Wait	1.40 (0.33)	1.40 (0.35)
Anger			
	Meal	1.08 (0.16)	1.08 (0.17)
	Task	1.20 (0.43)	1.23 (0.29)
	Wait	1.08 (0.12)	1.14 (0.25)
Confusion			
	Meal	1.34 (0.38)	1.26 (0.53)
	Task	1.34 (0.36)	1.27 (0.33)
	Wait	1.45 (0.41)	1.51 (0.51)
Total Mood	Meal	4.32 (1.42)	4.54 (1.54)
	Task	4.89 (2.09)	5.09 (2.14)
	Wait	5.34 (1.08)	6.31 (1.78)

* indicates significant change from post-mood induction to post-activity @ $p < 0.05$
** $p < 0.01$

Table 6

Negative Mood Group Mood Change from Post-Mood Induction to Post Activity

POMS-SF Subscale	Activity	Post-Mood Induction Mean(SD)	Post-Activity Mean (SD)
Depression			
	Meal	1.62 (0.75)	1.33 (0.57)
	Task	1.59 (0.75)	1.32 (0.57)**
	Wait	1.72 (0.88)	1.40 (0.62)*
Vigor			
	Meal	1.67 (0.84)	2.00 (0.85)
	Task	1.57 (0.75)	2.14 (0.70)
	Wait	1.90 (0.87)	1.65 (0.64)
Fatigue			
	Meal	2.16 (0.90)	1.76 (0.62)*
	Task	2.23 (0.73)	2.05 (0.67)*
	Wait	2.48 (1.13)	2.22 (1.07)
Tension			
	Meal	1.45 (0.62)	1.36 (0.67)
	Task	1.66 (0.64)	1.80 (0.67)
	Wait	1.80 (0.77)	1.77 (0.64)
Anger			
	Meal	1.35 (0.69)	1.25 (0.58)
	Task	1.38 (0.55)	1.36 (0.45)
	Wait	1.61 (0.87)	1.59 (0.91)
Confusion			
	Meal	1.65 (0.70)	1.37 (0.68)**
	Task	1.66 (0.54)	1.57 (0.54)
	Wait	1.77 (0.70)	1.68 (0.74)
Total Mood			
	Meal	6.56 (3.03)	5.12 (2.81)*
	Task	6.94 (2.83)	5.55 (2.04)
	Wait	7.49 (3.60)	6.62 (3.63)

* indicates significant change from post-mood induction to post-activity @ $p < 0.05$
** $p < 0.01$

Table 7

No Mood Group Mood Change from Post-Mood Induction to Post Activity

POMS-SF Subscale	Activity	Post-Mood Induction Mean(SD)	Post-Activity Mean (SD)
Depression			
	Meal	1.34 (0.41)	1.16 (0.27)*
	Task	1.30 (0.39)	1.23 (0.42)
	Wait	1.17 (0.32)	1.16 (0.27)
Vigor			
	Meal	2.14 (0.81)	1.78 (0.60)*
	Task	2.05 (0.96)	1.80 (0.78)
	Wait	2.25 (0.95)	2.17 (1.02)
Fatigue			
	Meal	2.34 (0.74)	1.82 (0.67)**
	Task	2.27 (1.07)	2.19 (0.92)
	Wait	2.02 (0.85)	2.00 (0.77)
Tension			
	Meal	1.79 (0.78)	1.45 (0.50)**
	Task	1.89 (0.49)	1.79 (0.62)
	Wait	1.33 (0.35)	1.31 (0.43)
Anger			
	Meal	1.29 (0.38)	1.17 (0.23)
	Task	1.43 (0.53)	1.41 (0.53)
	Wait	1.19 (0.25)	1.18 (0.31)
Confusion			
	Meal	1.76 (0.61)	1.42 (0.34)**
	Task	1.80 (0.46)	1.57 (0.46)
	Wait	1.42 (0.31)	1.38 (0.37)
Total Mood			
	Meal	6.73 (2.89)	5.46 (2.06)*
	Task	6.55 (3.07)	6.61 (2.72)
	Wait	3.59 (2.72)	3.79 (2.03)

* indicates significant change from post-mood induction to post-activity @ $p < 0.05$
** $p < 0.01$

Table 8

Self focus difference score Mean (SD)

Group	Activity	Baseline	Post Mood	Post-M/T/W
Positive				
	Meal	6.31 (4.64)	6.17 (4.22)	5.38 (4.94)
	Task	5.53 (3.82)	5.07 (3.17)	5.20 (2.43)
	Wait	5.58 (5.35)	5.83 (5.41)	6.25 (4.97)
Negative				
	Meal	5.31 (4.21)	5.88 (4.33)	4.13 (4.63)
	Task	6.79 (4.01)	4.37 (3.52)	5.37 (3.75)
	Wait	5.00 (3.96)	4.73 (4.57)	4.67 (4.56)
No Mood				
	Meal	5.15 (3.41)		5.42 (5.29)
	Task	6.20 (2.44)		5.30 (4.47)
	Wait	7.91 (3.39)		6.91 (4.59)

Figure 1. Mood Induction Manipulation Check.

POMS Total Mood Disturbance score by mood induction group.

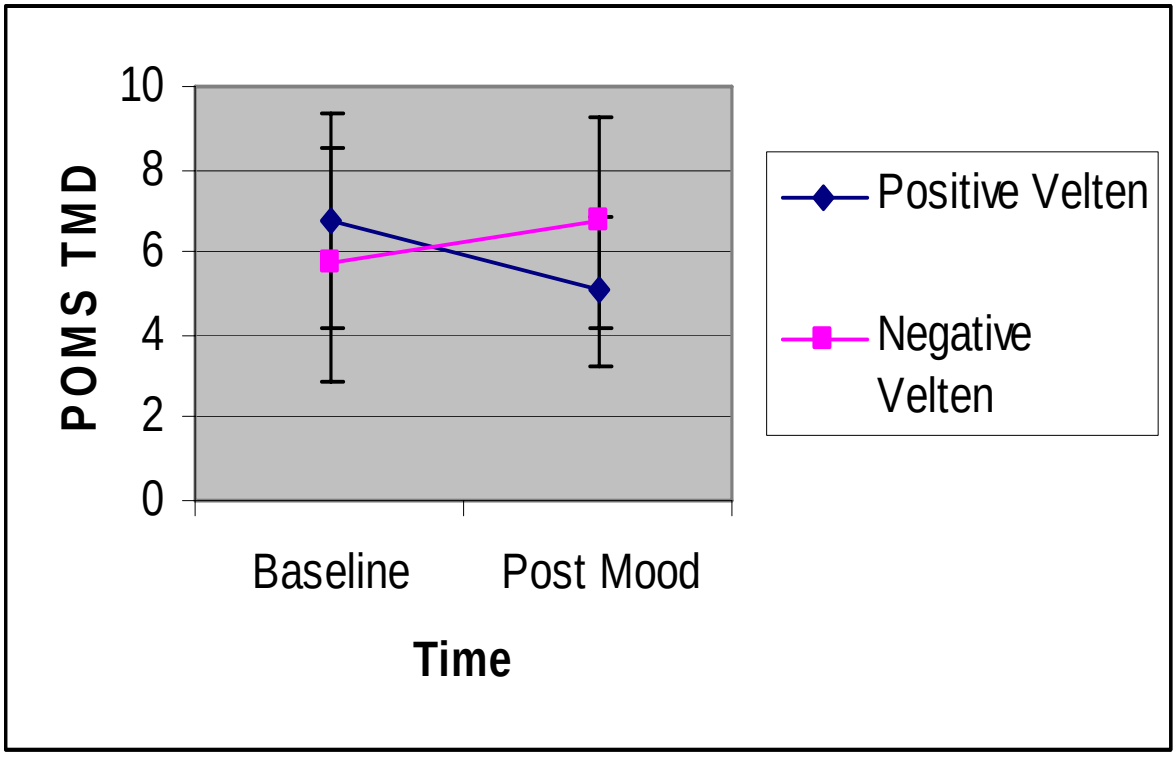


Figure 2. Change in Total Mood Disturbance by group over time.

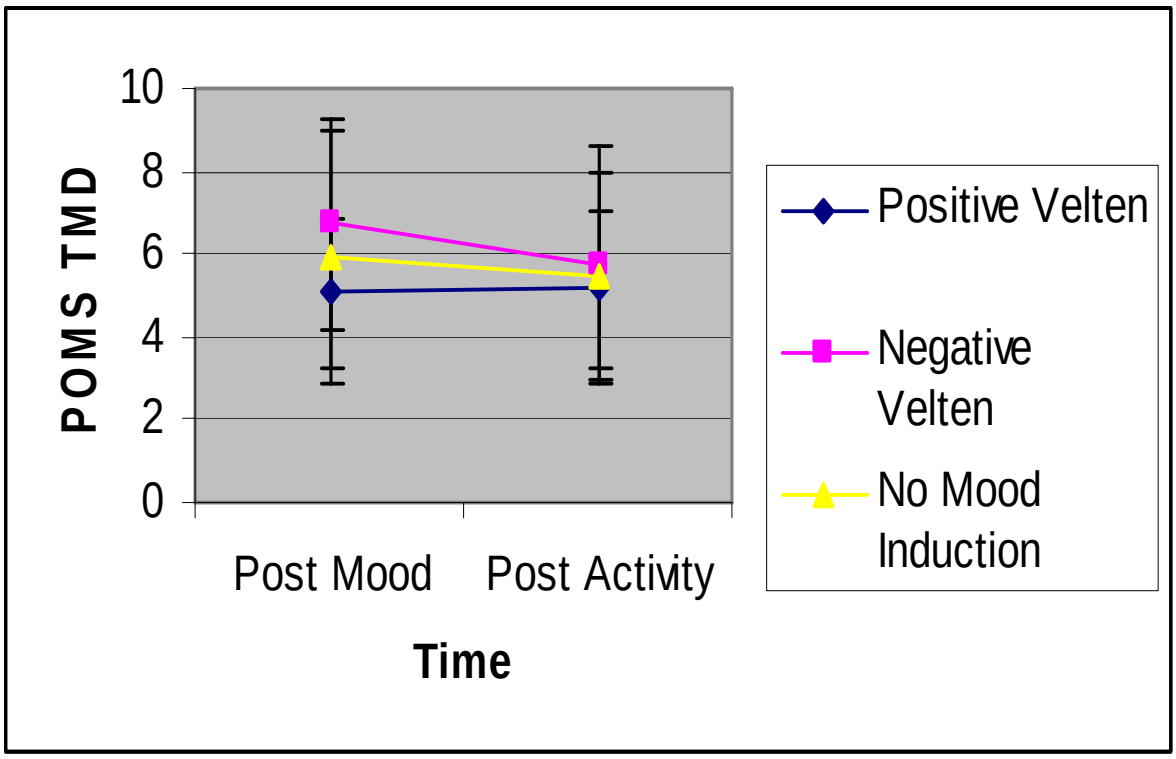


Figure 3. Change in Total Mood Disturbance by activity over time

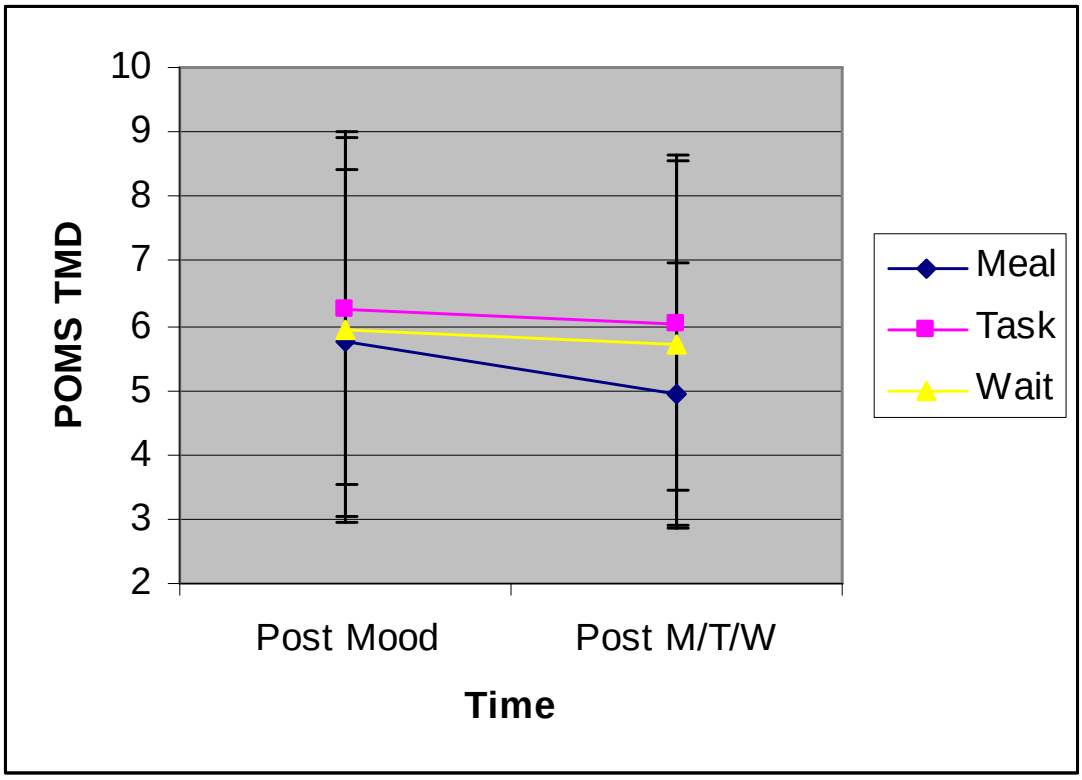

10
9
8
7
6
5
4
3
2
POMS TMD
Post Mood
Post M/T/W
Time
Meal
Task
Wait

Figure 4. Self focus difference scores by group.

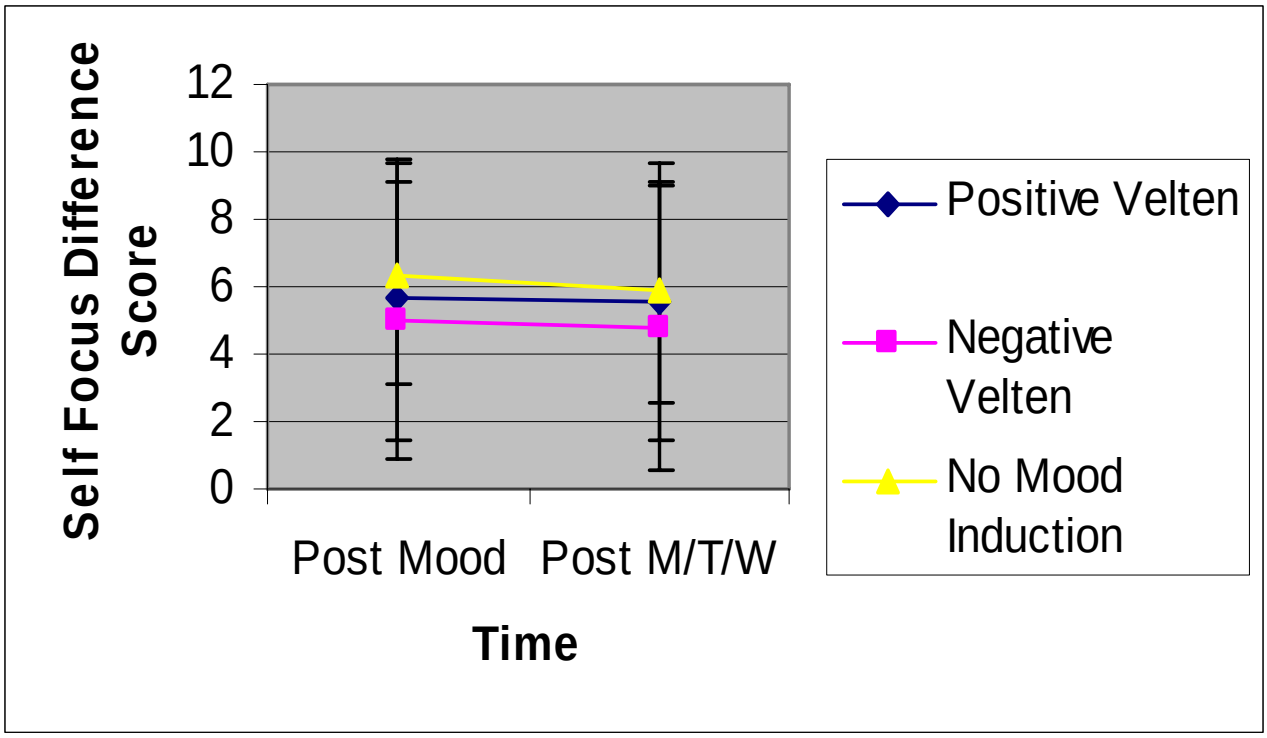
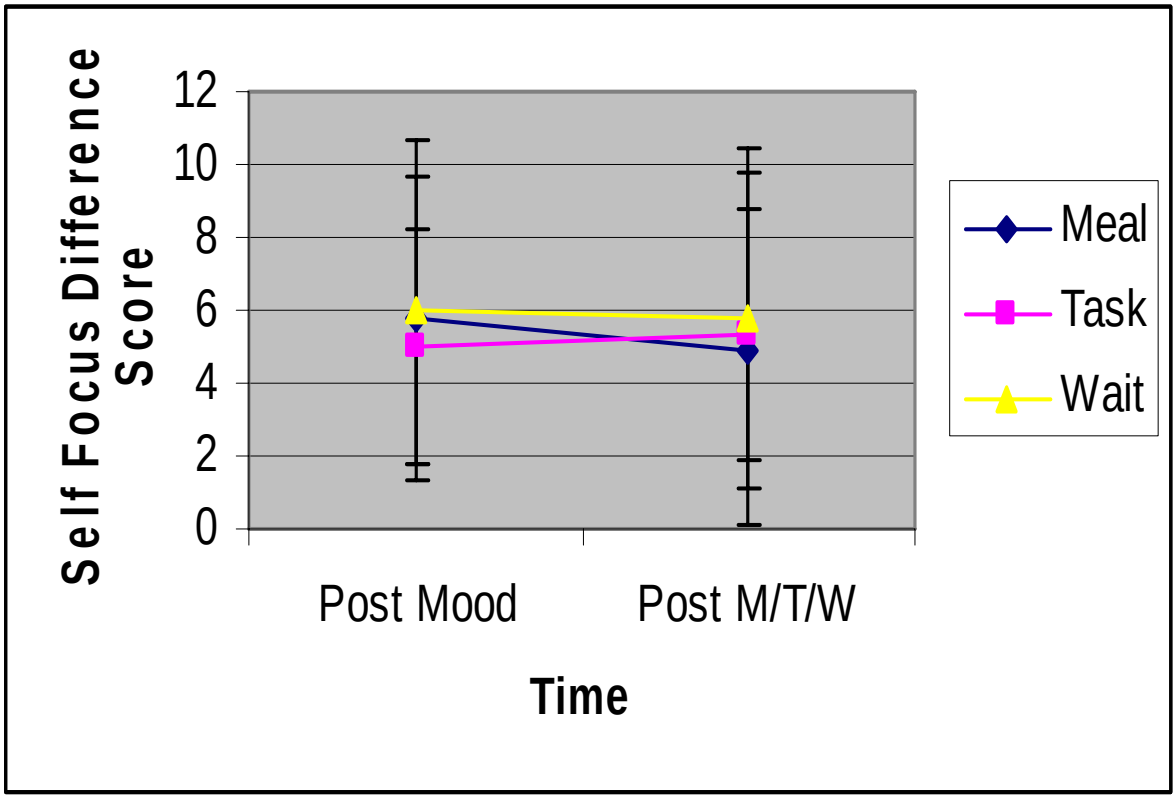


Figure 5. Change in Self Focus Difference Score by Activity.



COGNITIVE TASKS

PROTOCOL

1. Say:

The next task involves cognitive tasks that increase in difficulty even though they may not seem difficult. You have 15 minutes to complete as much as you can. Please work in order and as accurately and as quickly as you can. If you finish early please record your time and wait until I return.

2. Place the COGNITIVE TASKS packet and two pencils directly in front of the subject and allow them to read the instructions. Start the stopwatch. The directions they will receive are as follows:

The following pages contain a series of cognitive tasks. Place the packet directly in front of you. The first two pages show a series of letters. You are to circle each letter "A". Next you will find two pages of symbols. You are to circle all of the targets identified as an open circle crossed with a single slanted line. Directions for completing the remaining cognitive tasks are located at the top of each page. Please work as quickly and as accurately as possible. You have 15 minutes. If you finish early please record time completed from stopwatch.

3. In 15 minutes stop time and collect forms.

COGNITIVE TASKS

DIRECTIONS:

The following pages contain a series of cognitive tasks. Place the packet directly in front of you. The first two pages show a series of letters. You are to circle each letter "A". Next you will find two pages of symbols. You are to circle all of the targets identified as an open circle crossed with a single slanted line. Directions for completing the remaining cognitive tasks are located at the top of each page. Please work as quickly and as accurately as possible. You have 15 minutes. If you finish early please record time completed from stopwatch.

N X E A P W B V A Q H R Y A K O G M A Z L O

A F Z R U A T I L S C X E P W B A Q V D G A

Q I O G A V K Y D U A A B Z T F J A L R M C

B A L P K R A J E I O Z H V X A Q F W S A U

T J S A F M Z V A K L E U A R I H P A O B X

F N R E W C A H P Y Q M J S D A Z V K I G L

U A I Z X A O B L F T G P Y C W A E R H A N

L V A J P S R K I A B N A F X U M Q D A C W

O K Q D C M H W G E V R S B I L Z T Y F U J

Y Z A U T I G F S A J O A D P H N R M A E V

E A W H R A L T B M D V I G O S A K U X A P

R T P Y N K A S W L U C Q E H A F B J O Z I

H B K A G O C E A P R I W A U Q L D A T S Y

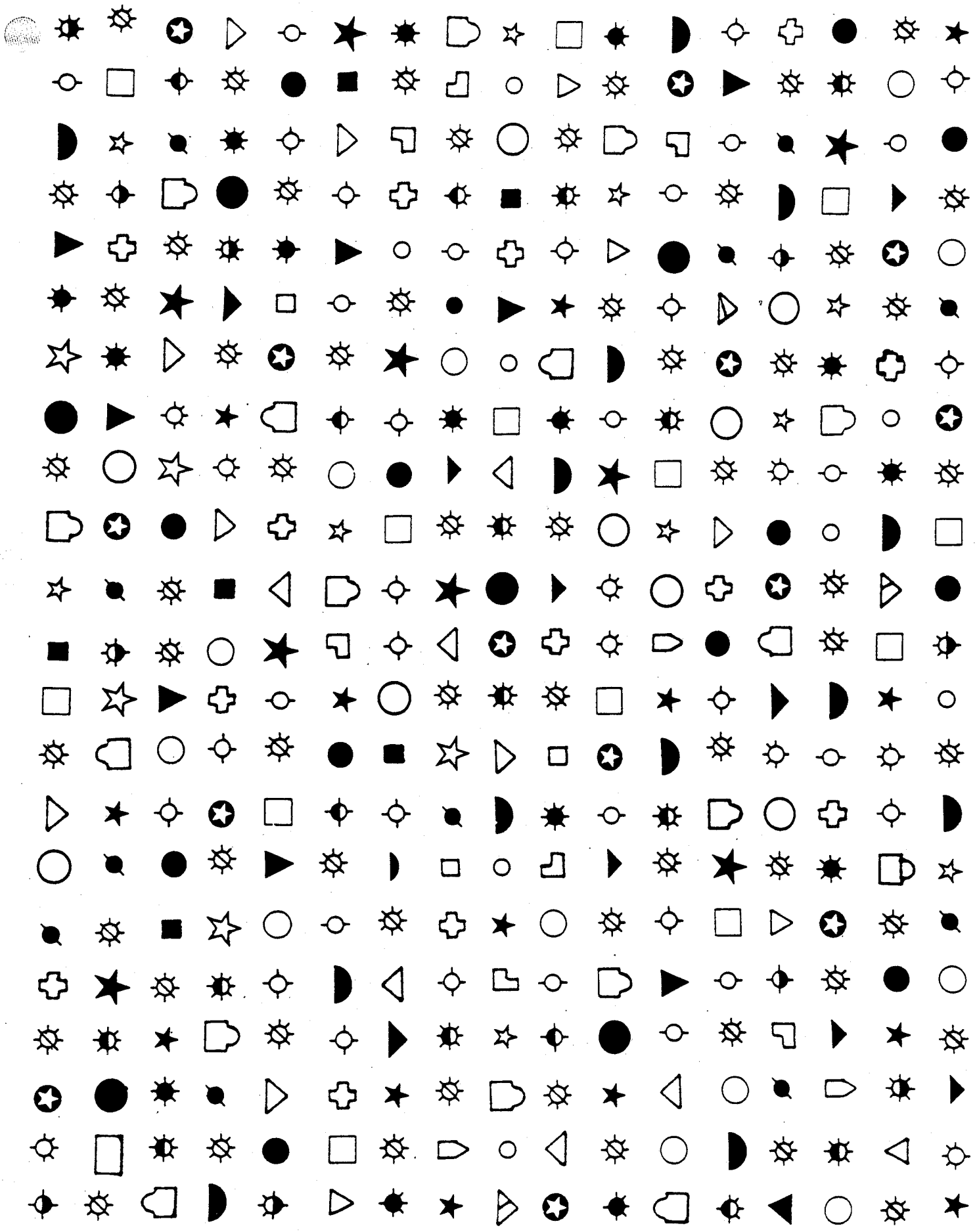
D A J S I L A N F R E P C H V A O G T B A K

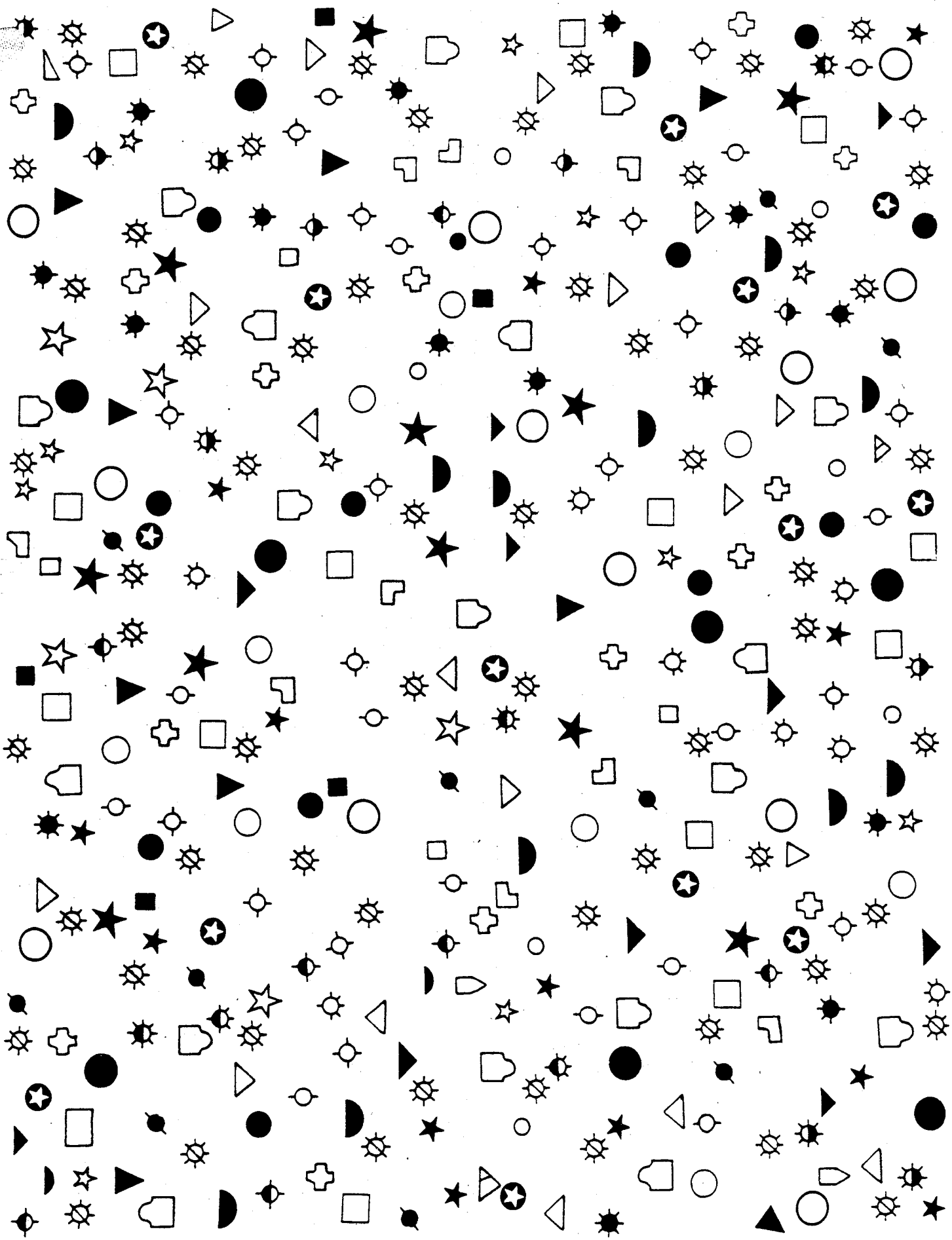
C Q T B A E W O R J A A L I M D S A H G K F

A L G I D A S M K B F H R U E J A O P C N A

S E H A B W F P A G Z T K A Q Y R C A U I M

N E A P W V A Q H R Y A Z L A O D G
X Z U B I L S C N K O G X M A P Q V A
A F R A T D U N B T E W M
I P Z F S J A L B R C
Q O B G A V K A A
Y R J O H V X Q A W U A
L P L Z F
A A
B S F K E I E U R A I H
T J A M V K A H M A D P V B X
Z C P J S Y A Z O K
R A W
F N E X B Q Y G P C W I G L
Z
I A O A L T H N F A E A N
U Q D U R A H
A M G A V L A R S B X Q M W
O K C H W E F N I C
D M
U T S R D P H N R V
Y D I S J G E
A H R G F A U O A O A E S
E
W T M T V I U
T A L A A K E X A F P
R Y N K S B W D C Q O A Z H
H P A L B J
B K U I D Q A T S Y
J S A L G C A A L I
I E P W U O T G
D A N F R P B A
E W A J R E K C H V A S G A K F P C N
C Q T B A O R S M F B A R A L I M D H O
A L I A F P Z V O R U E J Y A U I D A
E G D W G A H T T K A Q R C A M R Y
S H A B





SHIPLEY INSTITUTE OF LIVING SCALE

Administration Form

Walter C. Shipley, Ph.D.

Published by

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Publishers and Distributors
12031 Wilshire Boulevard
Los Angeles, California 90025

Name: _____ Sex: M F Age: _____

Education: _____ Usual Occupation: _____ Today's Date: _____

Part I

Instructions: In the test below, the first word in each line is printed in capital letters. Opposite it are four other words. Circle the *one word* which means the *same thing*, or most nearly the same thing, as the first word. If you don't know, guess. Be sure to circle the *one word* in each line that means the same thing as the first word.

EXAMPLE:

LARGE	red	(big)	silent	wet

(1) TALK	draw	eat	speak	sleep	☐
(2) PERMIT	allow	sew	cut	drive	☐
(3) PARDON	forgive	pound	divide	tell	☐
(4) COUCH	pin	eraser	sofa	glass	☐
(5) REMEMBER	swim	recall	number	defy	☐
(6) TUMBLE	drink	dress	fall	think	☐
(7) HIDEOUS	silvery	tilted	young	dreadful	☐
(8) CORDIAL	swift	muddy	leafy	hearty	☐
(9) EVIDENT	green	obvious	skeptical	afraid	☐
(10) IMPOSTOR	conductor	officer	book	pretender	☐
(11) MERIT	deserve	distrust	fight	separate	☐
) FASCINATE	welcome	fix	stir	enchant	☐
(13) INDICATE	defy	excite	signify	bicker	☐
(14) IGNORANT	red	sharp	uninformed	precise	☐
(15) FORTIFY	submerge	strengthen	vent	deaden	☐
(16) RENOWN	length	head	fame	loyalty	☐
(17) NARRATE	yield	buy	associate	tell	☐
(18) MASSIVE	bright	large	speedy	low	☐
(19) HILARITY	laughter	speed	grace	malice	☐
(20) SMIRCHED	stolen	pointed	remade	soiled	☐
(21) SQUANDER	tease	belittle	cut	waste	☐
(22) CAPTION	drum	ballast	heading	ape	☐
(23) FACILITATE	help	turn	strip	bewilder	☐
(24) JOCOSE	humorous	paltry	fervid	plain	☐
(25) APPRISE	reduce	strew	inform	delight	☐
(26) RUE	eat	lament	dominate	cure	☐
(27) DENIZEN	senator	inhabitant	fish	atom	☐
(28) DIVEST	dispossess	intrude	rally	pledge	☐
(29) AMULET	charm	orphan	dingo	pond	☐
(30) INEXORABLE	untidy	involatile	rigid	sparse	☐
(31) SERRATED	dried	notched	armed	blunt	☐
(32) LISSOM	moldy	loose	supple	convex	☐
(33) MOLLIFY	mitigate	direct	pertain	abuse	☐
(34) PLAGIARIZE	appropriate	intend	revoke	maintain	☐
(35) ORIFICE	brush	hole	building	lute	☐
(36) QUERULOUS	maniacal	curious	devout	complaining	☐
(37) PARIAH	outcast	priest	lentil	locker	☐
(38) ABET	waken	ensue	incite	placate	☐
(39) TEMERITY	rashness	timidity	desire	kindness	☐
(40) PRISTINE	vain	sound	first	level	☐

DO NOT WRITE IN THIS AREA

Turn over this sheet and continue with Part II

Vocabulary raw score _____

Part II

Instructions: Complete the following by filling in either a number or a letter for each dash (____). Do the items in order, but don't spend too much time on any one item.

EXAMPLE: A B C D E

(1) 1 2 3 4 5 ___

(2) white black short long down ___ ___

(3) AB BC CD D ___

(4) Z Y X W V U ___

(5) 12321 23432 34543 456 ___ ___

(6) NE/SW SE/NW E/W N/ ___

(7) escape scape cape ___ ___ ___

(8) oh ho rat tar mood ___ ___ ___ ___

(9) A Z B Y C X D ___

(10) tot tot bard drab 537 ___ ___ ___

(11) mist is wasp as pint in tone ___ ___

(12) 57326 73265 32657 26573 ___ ___ ___ ___ ___

(13) knit in spud up both to stay ___ ___

(14) Scotland landscape scapegoat ___ ___ ___ ___ ee

(15) surgeon 1234567 snore 17635 rogue ___ ___ ___ ___ ___

(16) tam tan rib rid rat raw hip ___ ___ ___

(17) tar pitch throw saloon bar rod fee tip end plank ___ ___ ___ ___ ___ meals

(18) 3124 82 73 154 46 13 ___

(19) lag leg pen pin big bog rob ___ ___ ___

(20) two w four r one o three ___

DO NOT WRITE IN THIS AREA

Summary Scores

V: Raw _____ T _____ A: Raw _____ T _____ Total: Raw _____ T _____

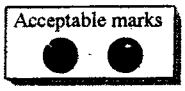
Abstraction raw score _____

POMS

Subject ID		

Directions:

Fill in circles completely.
Erase errors completely.
Keep within boxes.
Do NOT make any stray marks.
Do NOT fold.

Acceptable marks 

This is a machine readable form. Please do not fold or make extraneous marks.

Use ONLY a #2 pencil
Erase cleanly

This scale consists of a number of words that describe different feelings and moods people have. Please read EVERY word carefully. Select the answer which best describes how you feel AT THIS MOMENT by placing a check or X in the appropriate box.

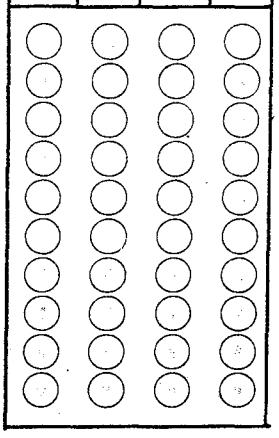
1. Not at all
2. A little bit
3. Moderately
4. Quite a bit
5. Extremely

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Worn-out	○	○	○	○	○
2. Angry	○	○	○	○	○
3. Tense	○	○	○	○	○
4. Confused	○	○	○	○	○
5. Lively	○	○	○	○	○
6. Sad	○	○	○	○	○
7. Fatigued	○	○	○	○	○
8. Peeved	○	○	○	○	○
9. On edge	○	○	○	○	○
10. Unable to concentrate	○	○	○	○	○
11. Active	○	○	○	○	○
12. Blue	○	○	○	○	○
13. Exhausted	○	○	○	○	○
14. Grouchy	○	○	○	○	○
15. Uneasy	○	○	○	○	○
16. Bewildered	○	○	○	○	○
17. Energetic	○	○	○	○	○
18. Hopeless	○	○	○	○	○
19. Weary	○	○	○	○	○
20. Annoyed	○	○	○	○	○

	Not at all	A little bit	Moderately	Quite a bit	Extremely
21. Restless	○	○	○	○	○
22. Forgetful	○	○	○	○	○
23. Cheerful	○	○	○	○	○
24. Discouraged	○	○	○	○	○
25. Bushed	○	○	○	○	○
26. Resentful	○	○	○	○	○
27. Nervous	○	○	○	○	○
28. Uncertain about things	○	○	○	○	○
29. Full of pep	○	○	○	○	○
30. Miserable	○	○	○	○	○
31. Bitter	○	○	○	○	○
32. Anxious	○	○	○	○	○
33. Vigorous	○	○	○	○	○
34. Helpless	○	○	○	○	○
35. Furious	○	○	○	○	○
36. Worthless	○	○	○	○	○
37. Unhappy	○	○	○	○	○

BAI

Subject ID



Directions:

Fill in circles completely.
Erase errors completely.
Keep within boxes.
Do NOT make any stray marks.
Do NOT fold.

Acceptable marks: ● ●

This is a machine readable form. Please do not fold or make extraneous marks.

Use ONLY a #2 pencil
Erase cleanly

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the PAST WEEK, INCLUDING TODAY, by filling in the appropriate circle corresponding to each symptom.

	NOT AT ALL	MILDLY It did not bother me much	MODERATELY It was very unpleasant, but I could stand it	SEVERELY I could barely stand it
1. Numbness or tingling.	○	○	○	○
2. Feeling hot.	○	○	○	○
3. Wobbliness in legs.	○	○	○	○
4. Unable to relax.	○	○	○	○
5. Fear of the worst happening.	○	○	○	○
6. Dizzy or lightheaded.	○	○	○	○
7. Heart pounding or racing.	○	○	○	○
8. Unsteady.	○	○	○	○
9. Terrified.	○	○	○	○
10. Nervous.	○	○	○	○
11. Feelings of choking.	○	○	○	○
12. Hands trembling.	○	○	○	○
13. Shaky.	○	○	○	○
14. Fear of losing control.	○	○	○	○
15. Difficulty breathing.	○	○	○	○
16. Fear of dying.	○	○	○	○
17. Scared.	○	○	○	○
18. Indigestion or discomfort in adbomen.	○	○	○	○
19. Faint.	○	○	○	○
20. Face flushed.	○	○	○	○
21. Sweating (not due to heat).	○	○	○	○

Administration: ○ ○ ○

Subject ID

BDI

Directions:

- Fill in circles completely.
- Erase errors completely.
- Keep within boxes.
- Do NOT make any stray marks.
- Do NOT fold.

Acceptable marks: ● ●

This is a machine readable form. Please do not fold or make extraneous marks.

Use ONLY a #2 pencil.
Erase cleanly

On this questionnaire are groups of statements. Please read each group of statements carefully. Then choose the statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY.

Fill in the circle beside the statement you choose. If several statements in the group seem to apply equally well, fill in each one. Be sure to read all the statements in each group before making your choice.

1
- I do not feel sad.
- I feel sad.
- I am sad all of the time and I can't snap out of it.
- I am so sad or unhappy that I can't stand it.

2
- I am not particularly discouraged about the future.
- I feel discouraged about the future.
- I feel I have nothing to look forward to.
- I feel that the future is hopeless and that things cannot improve.

3
- I do not feel like a failure.
- I feel I have failed more than the average person.
- As I look back on my life, all I can see is a lot of failures.
- I feel I am a complete failure as a person.

4
- I get as much satisfaction out of things as I used to.
- I don't enjoy things the way I used to.
- I don't get real satisfaction out of anything anymore.
- I am dissatisfied or bored with everything.

5
- I don't feel particularly guilty.
- I feel guilty over many things I have done or should have done.
- I feel quite guilty most of the time.
- I feel guilty all of the time.

6
- I don't feel I am being punished.
- I feel I may be punished.
- I expect to be punished.
- I feel I am being punished.

7
- I don't feel disappointed in myself.
- I am disappointed in myself.
- I am disgusted with myself.
- I hate myself.

8
- I don't feel I am any worse than anybody else.
- I am critical of myself for my weaknesses or mistakes.
- I blame myself all the time for my faults.
- I blame myself for everything bad that happens.

9
- I don't have any thoughts of killing myself.
- I have thoughts of killing myself, but I would not carry them out.
- I would like to kill myself.
- I would kill myself if I had the chance.

10
- I don't cry anymore than usual.
- I cry more now than I used to.
- I cry all the time now.
- I used to be able to cry, but now I can't cry even though I want to.

11
- I am not more irritated now than I ever am.
- I get annoyed or irritated more easily than I used to.
- I feel irritated all the time now.
- I don't get irritated at all by the things that used to irritate me.

12
- I have not lost interest in other people.
- I am less interested in other people than I used to be.
- I have lost most of my interest in other people.
- I have lost all of my interest in other people.

Administration: ○ ○ ○

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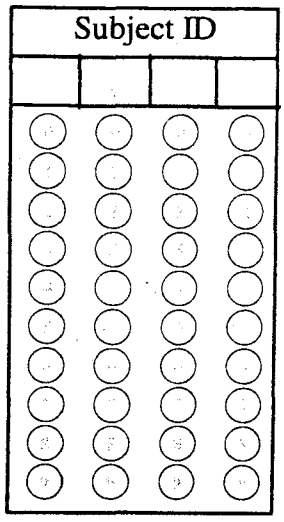
BDI Continued

Subject ID



Directions:
- Fill in circles completely.
- Erase errors completely.
- Keep within boxes.
- Do NOT make any stray marks.
- Do NOT fold.

Acceptable marks: ● ●

This is a machine readable form. Please do not fold or make extraneous marks.

Use ONLY a #2 pencil.
Erase cleanly.

13
- I make decisions about as well as I ever could.
- I put off making decisions more than I used to.
- I have greater difficulty in making decisions than before.
- I can't make decisions at all anymore.

14
- I don't feel I look any worse than I used to.
- I am worried that I am looking old or unattractive.
- I feel that there are permanent changes in my appearance that make me look unattractive.
- I believe that I look ugly.

15
- I can work as well as before.
- It takes an extra effort to get started at doing something.
- I have to push myself very hard to do anything.
- I can't do any work at all.

16
- I can sleep as well as usual.
- I don't sleep as well as I used to.
- I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
- I wake up several hours earlier than I used to and cannot get back to sleep.

17
- I become tired no more tired than usual.
- I become tired more easily than I used to.
- I get tired from doing almost anything.
- I am too tired to do anything.

18
- My appetite is no worse than usual.
- My appetite is not as good as it used to be.
- My appetite is much worse now.
- I have no appetite at all anymore.

19
- I haven't lost much weight, if any lately.
- I have lost more than 5 pounds.
- I have lost more than 10 pounds.
- I have lost more than 15 pounds.

I am purposely trying to lose weight by eating less. ○ ○

20
- I am no more worried about my health than usual.
- I am worried about physical problems such as aches and pains, or upset stomach, or constipation.
- I am very worried about physical problems, and it's hard to think of much else.
- I am so worried about my physical problems that I cannot think about anything else.

21
- I have not noticed any recent change in my interest in sex.
- I am less interested in sex than I used to be.
- I am much less interested in sex than I used to be.
- I have lost interest in sex completely.

Administration: ○ ○ ○

Self-Focus Sentence Completion Scale

Please complete the following sentences:

1. I think:
2. I was happiest when:
3. It's fun to daydream about:
4. My father:
5. If only I could:
6. It's hardest for me:
7. I wish:
8. As a child I:
9. I am:
10. I'm at my best:
11. Others:
12. When I look in the mirror:
13. If only I would:
14. At least I'm not:
15. My sex life:
16. It upsets me when:
17. The things I like best about myself:
18. Friends:
19. I would most like to be photographed:
20. I guess I'm: